Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

AVMA Convention—Cleveland, August 19-22, 1957

General Articles

Surgery and Obstetrics

Clinical Data

Editorial

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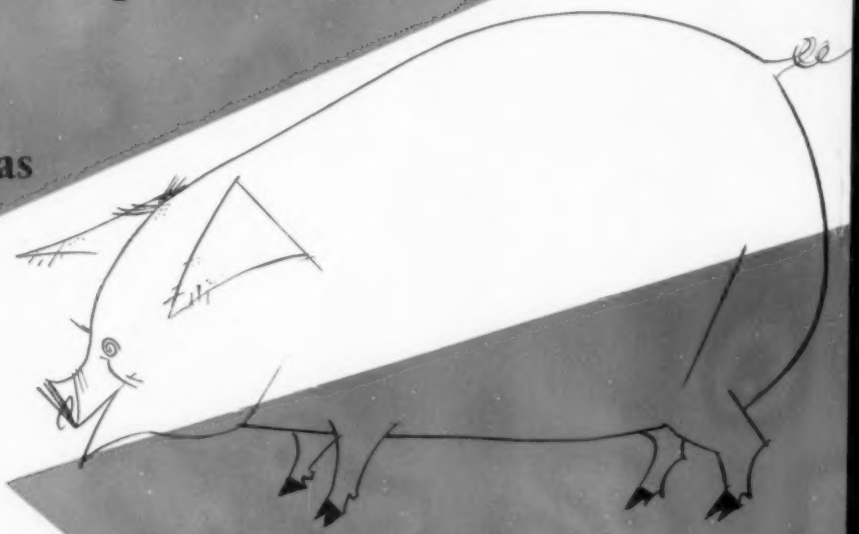
Vol. 130 **May 15, 1957** **No. 10**

For effective protection against swine erysipelas



ERYSIPELAS BACTERIN

Safety to the veterinarian, his helpers, and to swine is assured when administering Corn States Erysipelas Bacterin, a chemically killed, adsorbed, and concentrated culture of Erysipelothrix rhusiopathiae for use without serum in pigs or breeding stock.

Healthy herds of swine respond well to this vaccination. The adsorption and concentration to which this bacterin is subjected promote prolonged antibody stimulation. The resultant, high grade immunity develops in less than two weeks.

Many practitioners administer a booster injection to sows around breeding time. A 5 cc. dose is recommended. Corn States Erysipelas Bacterin is available in 50 cc. and 250 cc. vials.

Corn States LABORATORIES, INC.

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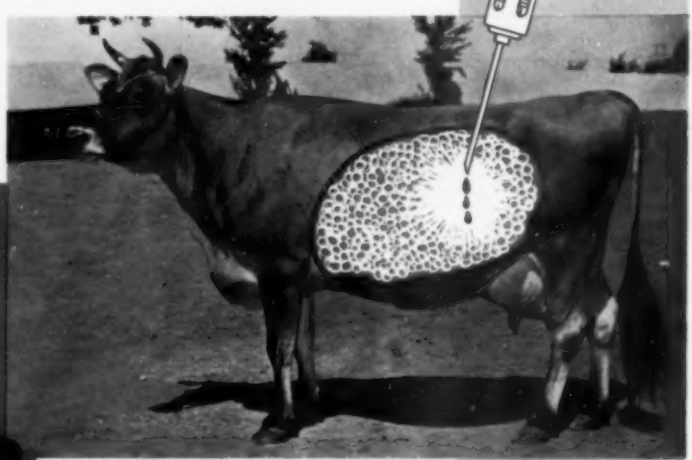

Here's why you'll prefer Fomene

- Reduces surface tension instantly to liberate entrapped gas.
- Helps prevent recurrent bloating.
- Versatile—administer directly into rumen with injection needle or small trocar; or use as drench or with stomach tube.
- Active ingredients are derived from natural edible sources—no interference with normal digestive functions.
- Cows like its alfalfa-like odor—makes drenching easy.

6—4 oz. Gallon

NL 152—Six 12 G., 4" needles

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Journal of the American Veterinary Medical Association

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SURGERY AND OBSTETRICS

CLINICAL DATA

NUTRITION

CURRENT LITERATURE

Abstracts

Foreign Abstracts

Books and Reports

$15.00 per Annum **Single Copies, $ .75 Prepaid in U.S.**
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Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class mail privileges authorized at Chicago, Ill., January, 1956. Additional entry at Mendota, Ill.

Correspondence

March 13, 1957

Dear Dr. Aitken:

I am informed by Dr. Nils Lagerlof that a district veterinarian in Sweden, engaged in general practice, would like to visit the U.S.A. He would like to contact an American veterinarian who is willing to do some type of exchange work. He suggests that the Swedish veterinarian would like to stay for some time with the American veteranian, and the latter might then spend some time with the former in Sweden.

Could you suggest some method of contacting an American veterinarian who might be interested in such an exchange?

s/M. G. Fincher,
Ithaca, N. Y.

Litters of Lambs.—A 2-year-old ewe in England recently gave birth to 5 ewe lambs, believed to be a record number.—*Vet. Rec. (Feb. 23, 1957).*

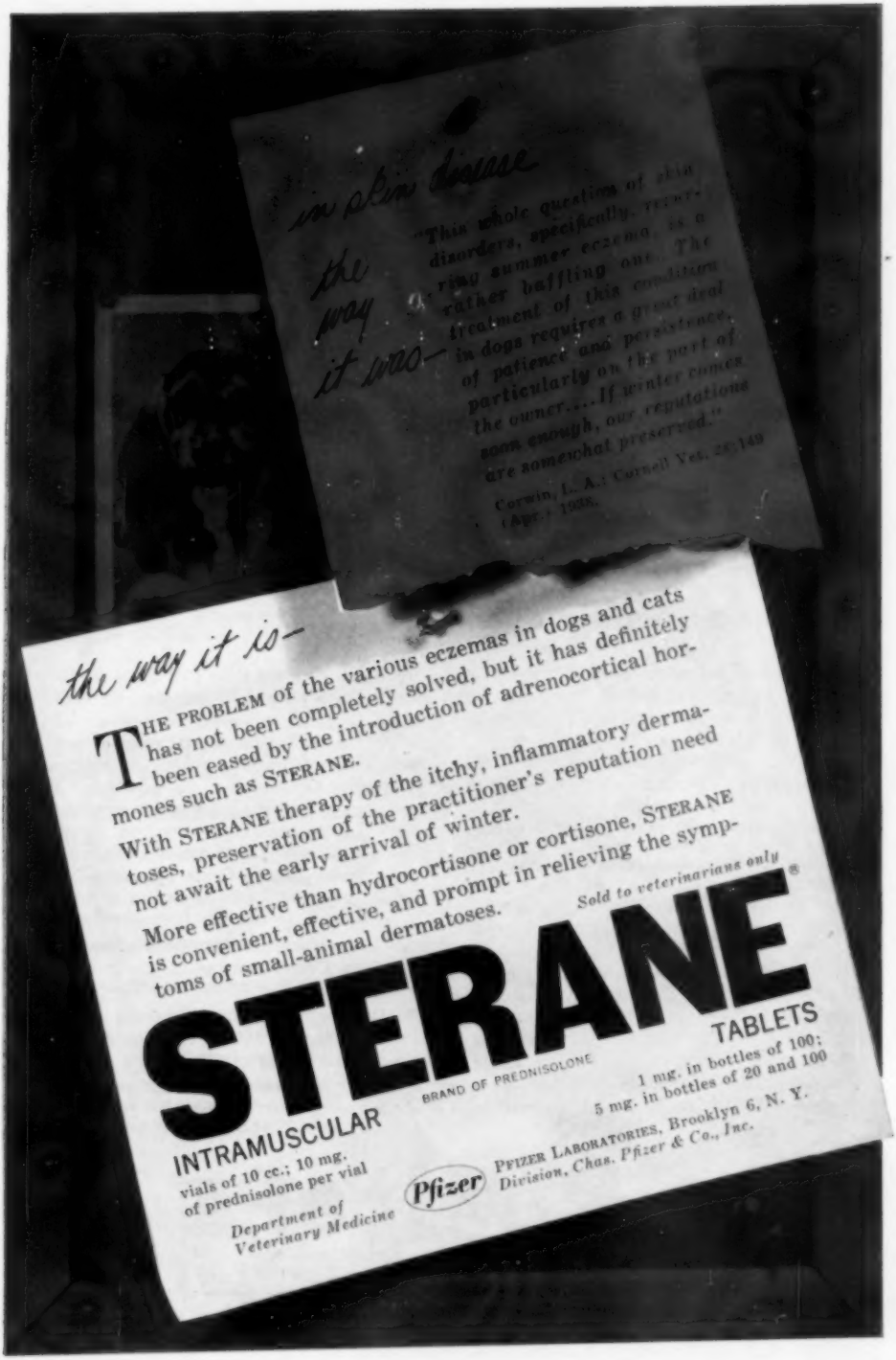
[*Life Magazine* (April 1, 1957) showed a picture of a ewe with 6 lambs (5 ewes and 1 ram).]

Contents—Continued

THE NEWS

MISCELLANEOUS

ORGANIZATION SECTION


in skin disease
the way it was—
"This whole question of skin disorders, specifically, recurring summer eczema, is a rather baffling one. The treatment of this condition in dogs requires a great deal of patience and persistence, particularly on the part of the owner.... If winter comes soon enough, our reputations are somewhat preserved."
Corwin, L. A.: Cornell Vet. 28:149 (Apr.) 1938.
the way it is—
THE PROBLEM of the various eczemas in dogs and cats has not been completely solved, but it has definitely been eased by the introduction of adrenocortical hormones such as STERANE.
With STERANE therapy of the itchy, inflammatory dermatoses, preservation of the practitioner's reputation need not await the early arrival of winter.
More effective than hydrocortisone or cortisone, STERANE is convenient, effective, and prompt in relieving the symptoms of small-animal dermatoses.
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1 mg. in bottles of 100;
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INTRAMUSCULAR
vials of 10 cc.; 10 mg.
of prednisolone per vial
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Division, Chas. Pfizer & Co., Inc.

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Exclusively for veterinary use Paxital, a new animal tranquilizer designed exclusively for veterinary use, produces a peaceful mental state *without sedation.* Animals remain normally responsive to surroundings. Paxital controls anxiety, nervousness and apprehension. It also appears to have a significant analgesic effect.

Broad clinical application Paxital is useful to eliminate barking and relieve nervousness or tension, especially in hospitalized animals. It is of value to reduce biting and scratching in skin conditions . . . for minor surgery when a general anesthetic is contraindicated or undesirable . . . as an adjunct in major surgery to permit smoother induction of anesthesia and an uneventful recovery (and to reduce the amount of barbiturates necessary) . . . to counteract shock and as an antiemetic.

Dosage: Average dose (for 20 to 30 lb. dog): *orally*—50 to 100 mg. two or three times daily, as indicated; *parenterally*—2 cc. (50 mg.). Paxital may be administered intravenously, intramuscularly or subcutaneously. Occasionally, an additional 2 cc. may be required to obtain the desired clinical response. Tranquilization is obtained usually within 45 minutes following oral administration. Onset of action following parenteral administration is more rapid.

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*TRADEMARK

Division of Veterinary Medicine **WARNER-CHILCOTT**

IN MASTITIS

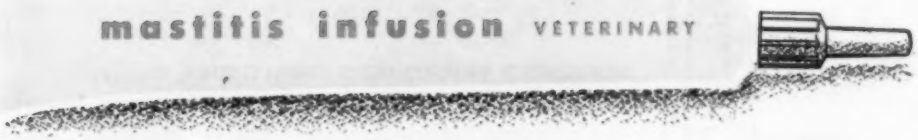
CHECK inflammation promptly

ERADICATE infection

REDUCE secretory tissue damage

METIBIOTIC

mastitis infusion VETERINARY



bridge the therapeutic gap in mastitis by reducing inflammation. In METIBIOTIC the more potent antiinflammatory properties of METICORTEN complement the wide antibacterial spectrum of **penicillin-dihydrostreptomycin,** which are bactericidal to the majority of mastitis organisms.

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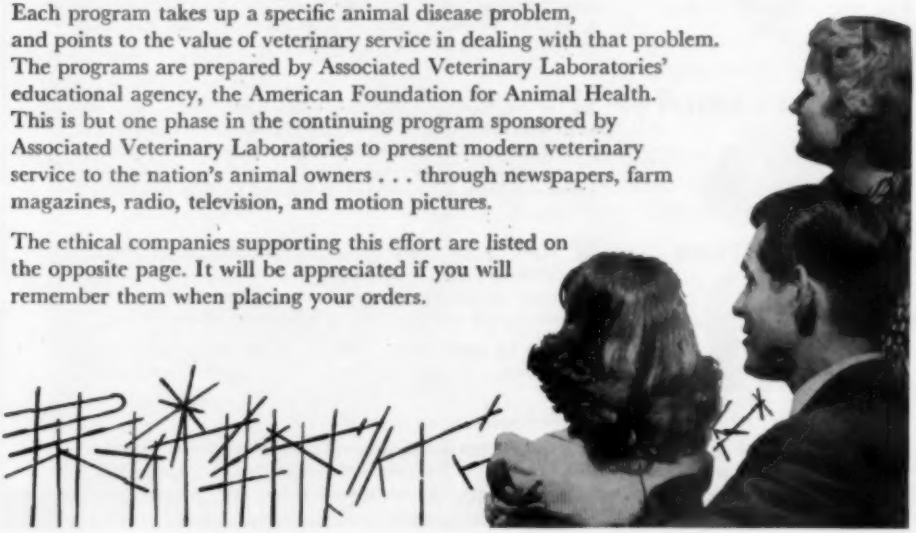
on television

Last year Associated Veterinary Laboratories launched a new pilot project to tell the values of veterinary service through a series of television broadcasts.

So great was the response that this project has now been placed on a 12-month basis with 140 key TV stations across the nation. Each program takes up a specific animal disease problem, and points to the value of veterinary service in dealing with that problem. The programs are prepared by Associated Veterinary Laboratories' educational agency, the American Foundation for Animal Health. This is but one phase in the continuing program sponsored by Associated Veterinary Laboratories to present modern veterinary service to the nation's animal owners . . . through newspapers, farm magazines, radio, television, and motion pictures.

The ethical companies supporting this effort are listed on the opposite page. It will be appreciated if you will remember them when placing your orders.



New Meat Product

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LOW COST
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4 BIG ADVANTAGES

1. ECONOMY

4-PAW is lower in moisture than other meat products such as horse meat or beef, because some water is removed from 4-PAW during processing. By mixing one part 4-PAW with two parts Dry Dog Food (kibble or meal) and adding warm water to obtain consistency desired, you have top nutrition at minimum cost.

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96% of 4-PAW consists of carefully selected meat by-products including generous amounts of liver from our own controlled, meat packing plants. Other ingredients supply calcium, phosphorus and vitamins.

Meat by-products	96%	Phosphoric acid	1.4%
Dicalcium phosphate	2.4%	Red Iron Oxide	0.1%
Cod Liver Oil	0.05%		

(Distributor Inquiries Invited)

Ask your local distributor, your Wilson & Co. Representative for prices and free folder, or write: Wilson & Co., Inc., Meat Packers, Prudential Plaza, Chicago 1, Ill.

4-PAW IS THE GREATEST SMALL ANIMAL NUTRITION DISCOVERY IN RECENT YEARS

DIAMOND introduces...

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A new, effective, and economical bloat preventative

Versatile is the word for Cilopen... It can be especially effective when used in either feed or water. Just one-half teaspoonful (rounded) of Cilopen per animal, per day makes it a most economical method for combating tympany in cattle. Case reports have proved that Cilopen is effective in chronic tympany cases as well as seasonal cases.

Cilopen is a double-action product, inasmuch as it contains both procaine penicillin G (17,000,000 units per pound) and methyl silicone (22.6 Gms. per pound). The penicillin inhibits the growth of the tympany producing bacteria, while the silicone acts to release accumulated gases in the rumen mass. Cilopen is the original antibiotic — silicone tympany preventative.

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One pound jars (12 to a carton)
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nonspecific dermatoses?

demodectic mange?

BEFORE SELEEN—Hound had suffered from demodectic mange almost from birth. In spite of therapy with almost every type of skin medicament, condition grew steadily worse. Photo taken four days before first SELEEN treatment.

AFTER SELEEN—Marked improvement shows in elimination of mange mites and lesions, clearing of affected areas, regrowth of haircoat. Photo taken 19 days and three SELEEN treatments after first picture.

704133

These dermatological and ectoparasitic conditions can be extremely troublesome—to patient, client and veterinarian. Today, such conditions are most effectively, most conveniently controlled in dogs *and* cats with

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SUSPENSION

Why?—Here's what you can expect when you treat these annoying conditions with SELEEN—

- *complete control* in 87% of nonspecific dermatoses . . . definite improvement in another 11%.
- *prompt relief* of itching and scratching . . . frequently after the initial treatment.
- *elimination of ectoparasites*, including fleas, lice and demodex mange mites.
- *thorough cleansing* of skin and haircoat . . . removal of tissue debris.

Like a shampoo, SELEEN lathers fast, rinses easily, has a pleasant odor and leaves no stains for carpets or furniture.

SELEEN Suspension, sold to veterinarians only, is supplied in 6-fl. oz., pint and economical gallon bottles. Order from Abbott Laboratories, North Chicago, Ill.; your nearest Abbott branch, or your distributor.

Abbott

News From Washington

Pay Ceiling Raised—The U.S.D.A. has received authority to pay veterinarians entering ARS in Grade GS-7 up to the top of Grade salary $5,335 (now $5,200); those initially employed and entering Grade GS-9 may be paid $6,115 (now $5,440). This authority also is applicable to veterinarians now in those grades. Effective date is June 30, 1957.

* * * *

Military—The action that Secretary of Defense Wilson will finally take concerning future status of the Army and Air Force Veterinary Corps may be made public shortly. When and if submitted, legislation will propose the Corps, per se, be abolished; the officers be transferred to the Medical Service Corps; and that certain Veterinary Corps functions, principally food inspection, be performed by one or more other government agencies (JOURNAL, Jan. 15, '57: adv. p. 10).

When contents of complete plan is definitely known, including proposed legislation, the information will be published in the JOURNAL, also other appropriate action taken.

* * * *

The Fifth Annual National Civil Defense Conference, sponsored by the A.M.A. Council on National Defense, will be held June 1, 1957, at the Waldorf Astoria in New York City.

This year's program emphasizes the responsibilities of the medical and allied professional groups with respect to the hazards and effects of lethal radiation and radioactive fall-out.

AVMA members are invited to participate in the conference. Those who desire to attend should notify Mr. Frank W. Barton, secretary, A.M.A. Council on National Defense, 535 N. Dearborn St., Chicago 10, Ill.

* * * *

Foot-and-Mouth Disease exists in the Channel Islands. The U.S.D.A., on April 3, 1957, prohibited importation of cattle, sheep, other domestic ruminants, and swine from those Islands; also restricted importation of certain meats and meat products.

* * * *

Legislative Action—The Senate passed S. 1747, to provide for compulsory inspection of poultry and poultry products (see JOURNAL, April 15, 1957; adv. p. 12 reference clean bill), after adopting a modified amendment respecting antemortem inspection in any official establishment.

The House Committee on Agriculture has not submitted a report on poultry inspection hearings held on March 6 and 7, 1957.

* * * *

NEW BILLS

Doctor Draft, H.R. 6548—Rep. Vinson (D. Ga.) amends the Universal Military Training and Service Act, as amended, to provide for selection or induction of medical, dental, or allied specialists pursuant to requisitions from the Secretary of Defense. Practically speaking, this bill has two major changes: (1) It does away with the priority categories; (2) there is no provision for continuing the medical advisory committee to Selective Service (Rusk Committee). Hearings are likely in May as present amendment expires June 30.

Protect Public from Communicable Poultry Diseases—S. 1756, introduced by Senator Williams (R., Del.), would authorize Secretary of Agriculture to impose quarantines, destroy poultry under certain circumstances, et cetera.

Milk Standards—H. R. 6750, 6795, introduced respectively by Congressmen Johnson (D., Wis.) and Marshall (D., Minn.), would establish standards of identity and sanitation practices for sale of milk shipped interstate.

Pre-Testing Food Additives—H.R. 6747 was introduced by Congressman Harris (D., Ark.), S. 1895 by Senators Hill (D., Ala.), Sparkman (D., Ala.), and Smith (R., N.J.), which would protect public health by prohibiting the use in food of chemical additives unless adequately tested to establish their safety.

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RABIES VACCINE

MODIFIED LIVE VIRUS—CHICK-EMBRYO ORIGIN—DESICCATED

A Superior Type... Gives Long Lasting Immunity

Affiliated Brand Rabies Vaccine is prepared from the chick embryo adapted attenuated Flury strain of rabies virus. The inoculated chicken embryos are harvested at time of maximum virus content. The harvested tissue is processed and desiccated from frozen state.

Experience indicates a single intramuscular injection of 3 cc of Rabies Vaccine, modified live virus, chick embryo origin induces a lasting *immunity within* 21 *days* after vaccination. This vaccine does not cause disease when injected . . . The test for potency of Affiliated Brand Rabies Vaccine is based on protection of guinea pigs against a challenge dose of virulent rabies street virus.

Supplied in: Single dose package (Vaccine and Diluent); Package of 5—1 dose vials (Vaccine and Diluent).

ALSO...

CANINE DISTEMPER VACCINE

Single dose gives prompt, enduring immunity!

Affiliated Brand Canine Distemper Vaccine, Modified Live Virus, Chick Embryo Origin, Desiccated, is prepared from an attenuated strain of canine distemper virus grown on embryonated eggs . . . A single 2 cc dose injected into healthy animals induces a prompt immunity. It is well tolerated and will not produce distemper in healthy pups. Potency and safety is determined by protection tests in highly susceptible animals such as ferrets or pups.

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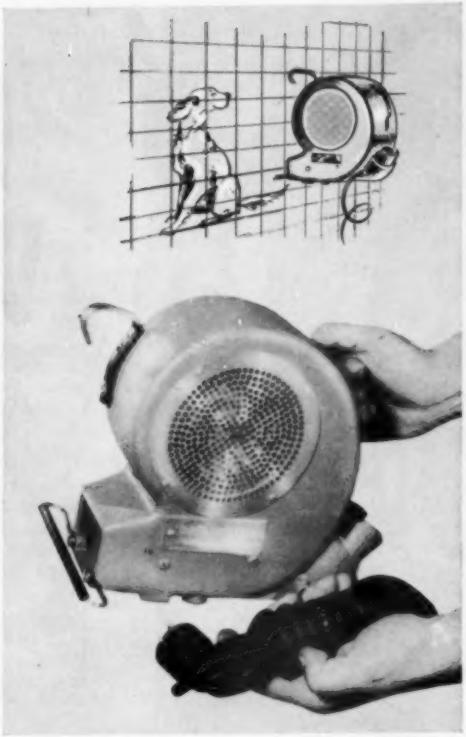

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* So compact - will fit on any cage

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PROTECTION AGAINST THESE COMMON POULTRY DISEASES

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Two nitrofurans—FUROXONE and FURACIN—exhibit unique advantages in the prevention or control of avian diseases. Low concentrations provide wide-spectrum antimicrobial activity yet permit the development of *natural* immunity. Rapidly metabolized, there is no danger of drug residue in tissue, even if birds are medicated up to the time of slaughter. The nitrofurans have no deleterious effect on eggs or egg production; provide protection to turkeys raised on range.

FUROXONE® CONCENTRATE VETERINARY

BRAND OF FURAZOLIDONE

For the prevention or treatment of salmonelloses (fowl typhoid, pullorum and the paratyphoids); histomoniasis (blackhead); hexamitiasis; synovitis (infectious arthritis) due to a filterable agent, and susceptible secondary bacterial infections associated with C. R. D. and nonspecific enteritis. Increases the efficiency of food utilization at lower dosages.

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New dosage form of FURACIN—an effective coccidiostat against E. tenella and necatrix. In cartons of 330 Gm. with plastic scoop, to medicate 50 gallons of drinking water.

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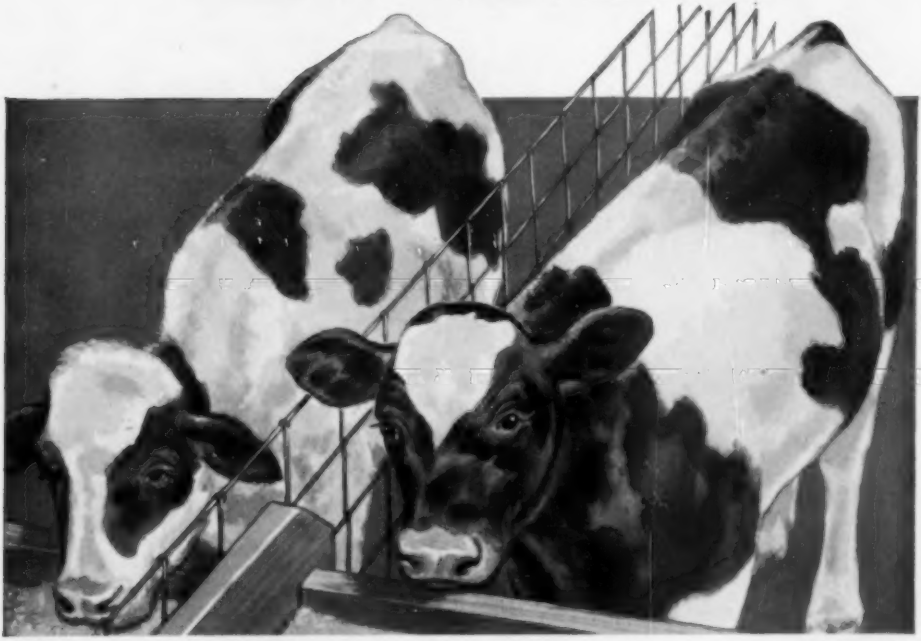
NITROFURANS—
A NEW CLASS OF
ANTIMICROBIALS—
NEITHER ANTIBIOTICS
NOR SULFONAMIDES

EATON LABORATORIES,
NORWICH, NEW YORK

The availability factor in phosphorus feeding



Who eats first at the phosphorus table?

Too often today, farm animals find themselves chained to a chair at the phosphorus table . . . don't get their fair share of phosphorus. Sometimes it's because part of the phosphorus ration is biologically out of reach.

Result: mild to severe phosphorus deficiencies, now reported in more than 20 states.

With severe cases, it's comparatively easy to make a diagnosis. But mild cases result in hidden losses that take a sizable cut out of the farmer's pocketbook. For instance, without involved tests, how do you diagnose:

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Symptoms of Vitamin D deficiency — a true shortage, or insufficient available phosphorus?

Trouble settling a cow — infectious disease, a shortage of vitamin E or low phosphorus availability?

Milk production falls off a bit — the start of ketosis or was it caused by phosphorus deficiency?

Soft eggs — bronchitis or phosphorus?

Simplest, easiest and most economical protection is to use only those reputable phosphorus products that are sure, safe, dependable and guaranteed in analysis and availability . . . the chemically-produced dicalcium and tricalcium phosphates.

Why chemically-produced phosphates are safer

Every lot of International's dicalcium and tricalcium phosphates are measured up on the same nutritional yardstick every time. They are chemically controlled, biologically tested and produced by the most modern industrial techniques.

That's why International's dicalcium and tricalcium phosphates are certain, low-cost insurance that your animals always will eat first at the phosphorus table . . . products such as:

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Multifos — 18 % P tricalcium phosphate
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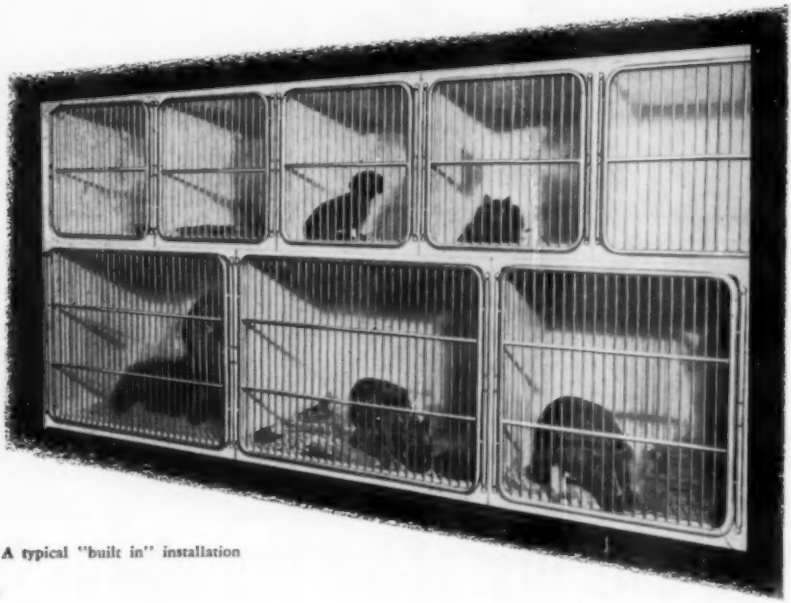

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Molded seamless construction from materials and by production methods developed especially for animal cages.

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Write dept. C-3 for literature and prices.

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Supplied: Saline Suspension of 'CORTONE' Acetate Veterinary: 50 mg./cc., vials of 10 cc.

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MSD

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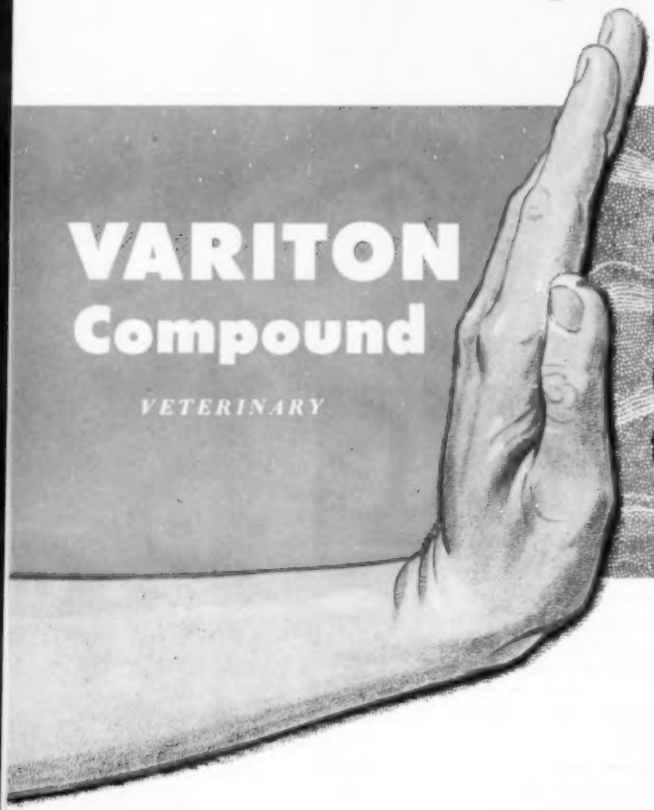
double therapy

in diarrheas of animals, both anticholinergic and antibacterial



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...blocks parasympathetic nerve impulses to the GI tract

the anticholinergic, diphemanil methylsulfate, decreases peristalsis, reduces secretions and suppresses inflammation

the antibacterial, phthalylsulfacetamide, penetrates all layers of the intestinal wall for more effective treatment of enteric infections

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6 jars, 24 boluses per jar.

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VARITON® Compound, brand of diphemanil methylsulfate and phthalylsulfacetamide.

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V-VT-J-117

protect livestock against screw worm infestations

WHITE SMEAR Plus*

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An effective treatment for all domestic animals. Kills screw worms *and* flies that settle on wound after treatment. Prevents reinfestation for 8-10 days. Apply on new cuts, etc. to prevent infestation. Easy to apply. Free flowing—non-staining.

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Sulfanilamide	5% w/w
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JOURNAL
of the American Veterinary Medical Association

Established January, 1877 Chicago 5, Illinois

Vol. 130 May 15, 1957 No. 10

Trichophyton Mentagrophytes Infections in Dogs and Cats

LUCILLE K. GEORG, Ph.D.; CHARLES S. ROBERTS, D.V.M.;
ROBERT W. MENGES, D.V.M.; WILLIAM KAPLAN, D.V.M.

Atlanta, Georgia, and Auburn, Alabama

A SURVEY of ringworm in animals, conducted by the mycology unit of the Communicable Disease Center,[1,2] has indicated that *Trichophyton mentagrophytes* is a fairly common cause of ringworm in dogs and an occasional cause of infections in cats. It also produces ringworm in other domesticated as well as wild animals, and is commonly isolated from the hair of rodents with or without signs of infection.[3-5]

Since few reports of *T. mentagrophytes* infections in dogs and cats have appeared in the literature,[6-9] it was felt that a discussion of this type of ringworm and the salient points in its laboratory diagnosis should be reviewed.

MATERIALS AND METHODS

During the course of the survey, specimens of animal hairs and skin scrapings, obtained by veterinarians from animals suspected of having ringworm, were submitted to the mycology unit from various parts of the United States.

During the first three years of the survey, 1,166 hair specimens from dogs and 446 from cats were studied. These were accompanied by data concerning age, sex, and breed of the animal; the nature of the lesions observed; and information concerning spread of infection to human contacts.

All specimens were examined in a darkened room for fluorescence under a Wood's light, followed by direct examination in 10 per cent potassium hydroxide (KOH). Whether or not these preliminary tests gave evidence of the presence of fungi, culture tubes were inoculated, utilizing a selective medium, Sabouraud's dextrose agar containing cycloheximide,* penicillin, and streptomycin.[10] All cultures were incubated at room temperature. Tubes were held for four weeks before discarded as negative.

Six mongrel pups were inoculated on the side of the neck to ascertain the course of the infection and the nature of the lesions produced in this species. Areas approximately 4 inches in diameter were shaved, scarified, and the growth from 8- to 10-day-old cultures of *T. mentagrophytes* (including several strains isolated from spontaneous ringworm of the dog) were rubbed on with sterile scalpels. The necks were bandaged for three days to keep the inoculum on the areas.

RESULTS

Of 1,166 dog hair specimens examined, 254 were found to be positive for ringworm infection. Of these, 170 (66.9%) were due to *Microsporum canis*, 66 (26.0%) were due to *Microsporum gypseum*, and 18 (7.1%) were due to *T. mentagrophytes* (table 1).

Microsporum canis infections of dogs and cats have been discussed in a number of publications.[11-14] The group of *M. gypseum* infections observed in dogs have been described in another publication.[15]

Trichophyton Mentagrophytes Ringworm in the Dog.—Although in this survey *T. mentagrophytes* ranked third, the number of cases was sufficient to indicate that this fungus is an important cause of ringworm in the dog.

General Clinical Characteristics of the Disease.—A comparative study indicated that there was no correlation between the type of lesion produced in the dog and the fungus species involved. Apparently, there are many other dermatological conditions which simulate ringworm, as no fungal elements were found either upon direct examination or culture from a large number of the specimens submitted. Also, many

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TABLE I—Dermatophyte Infections in Dogs and Cats*

Host	Total specimens examined	No. pos. for ringworm	Organisms isolated		
			Microsporum canis	Microsporum gypseum	Trichophyton mentagrophytes
Dogs	1,166	254	170 (66.9%)	66 (26.0%)	18 (7.1%)
Cats	446	194	190 (98.0%)	2 (1.0%)	2 (1.0%)
Total	1,612	448 (27.8%)	360 (80.4%)	68 (15.2%)	20 (4.5%)

*This table includes 922 dog and cat specimens, previously reported[2] of which 252 were positive for ringworm.

specimens were from animals that had been treated, which may have prevented the recovery of a fungal agent.

Accurate diagnosis of ringworm infections depended on observation of fungal elements in tissues and the isolation and identification of a dermatophyte.

Various degrees of involvement and tissue reaction, observed in the 18 cases of *T. mentagrophytes* infection, ranged from loss of hair, in small areas, to heavily crusted and inflamed lesions involving large areas of the animal's body.

Usually, lesions were restricted to small areas, particularly on the head and neck. The legs were involved in about half of the cases. Only 5 dogs had lesions scattered over many areas of the body.

In the majority of infections, tissue reaction was slight. In a common type of Trichophyton infection in the pup (fig. 1, A, B), there is loss of hair and scaling on the ears and at the friction points of the legs. Such infections are easily overlooked but may be a source of infection to other animals or to man. Heavily crusted, suppurative, or eczematoid lesions were seen less commonly.

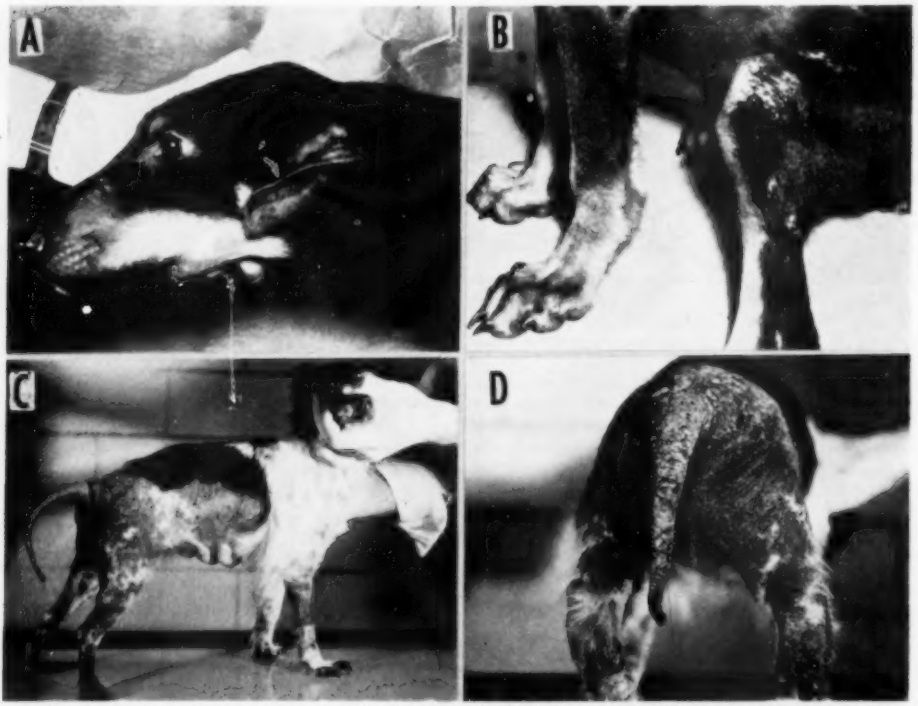

Fig. 1—Photograph of a young dog showing typical mild lesions of the skin, due to Trichophyton mentagrophytes, which consisted of loss of hair and scaling on the nose and ears (A) and at friction points on the hindlegs (B). Photographs C and D show severe infection which had been present for a year in a 5-year-old female Chinese Ching.

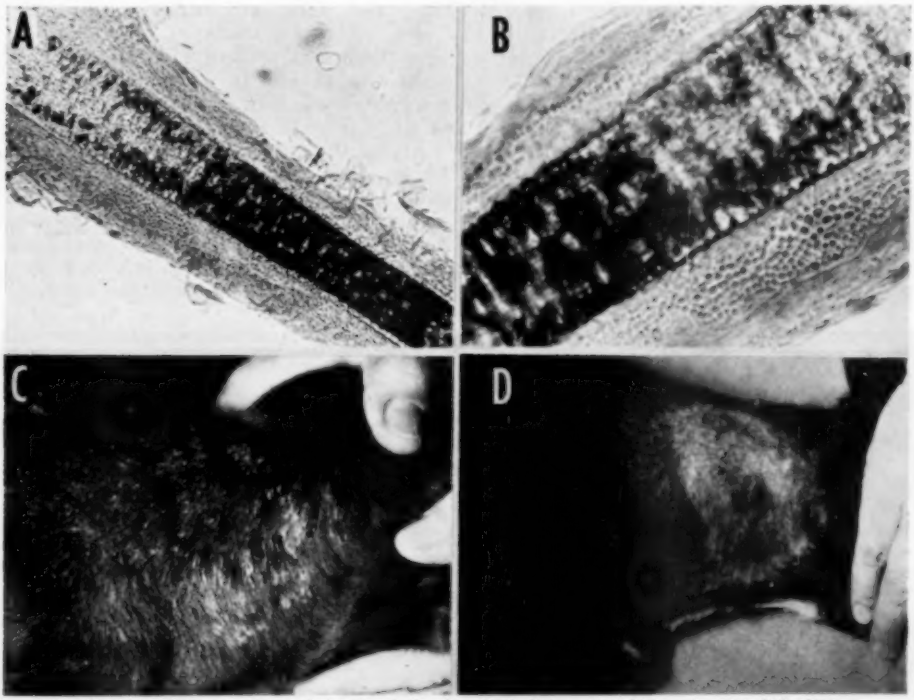

Fig. 2—Trichophyton mentagrophytes on shaft of a dog's hair, x 220 (A) and x 522 (B); (C) experimentally produced T. mentagrophytes infection on the neck of a pup at 16 days, the height of infection; and (D) experimentally produced T. mentagrophytes infection in the pup at 23 days.

One unusual case in which the infection involved most of the animal's skin was characterized by severe tissue reaction. This case, observed at Alabama Polytechnic Institute, occurred in a 5-year-old Chinese Ching† dog which had been brought from Japan. The infection was of about a year's duration and probably had been contracted in Japan. The animal showed loss of hair over most of the body. The skin, particularly on the posterior portion of the body, had become lichenified and was covered with a white crusty scale (fig. 1, C, D). The animal had been treated for six months with a wide variety of agents without beneficial results and euthanasia was finally requested.

Tissue sections of the skin revealed hyperkeratosis and parakeratosis with some areas of leukocytic infiltration into the corium. Hairs in the sections showed mycelium in their interiors and masses of spores on their exteriors.

†Name of breed given by the owner.

Wood's Light Examinations.—In none of the 18 dogs with *T. mentagrophytes* infections were fluorescent hairs observed. This is in marked contrast to *M. canis* infections where fluorescence of infected hairs is usually seen.

Direct Examination of KOH Preparations.—Direct microscopic examinations revealed fungal elements in 10 of the 18 animals studied. Infected hairs showed branching mycelium in their interiors and were surrounded by sheaths of arthrospores ranging from 3 to 5 μ in diameter. This is the typical pattern of hair invasion by *T. mentagrophytes* usually described as "small-spored ectothrix" or the "ectothrix microides" of Sabouraud[11] (fig. 2, A, B).

Cultural Studies.—Cultures of *T. mentagrophytes* were obtained in all dogs. The use of antibiotic mediums inhibited the growth of bacteria and saprophytic fungi and, in most cases, the pathogenic fungus was obtained in pure culture.

Except for one, which will be described

separately, all *T. mentagrophytes* isolated were similar. Growth was rapid on Sabouraud's dextrose agar and the colonies were flat or only slightly raised at their centers. Surface color varied from white to cream to tan and the texture was powdery to coarsely granular. The reverse side of some colonies were dull yellowish, others showed a deep red pigmentation (fig. 3, A).

Microscopic examination revealed masses of nearly round microconidia attached by delicate sterigmata or directly to the mycelium. Macroconidia were found in all cultures and were very numerous in some. These were characteristically clavate, several-celled structures with thin, smooth walls (fig. 3, C). In some colonies, they were extremely long and slender, composed of six to ten cells (fig. 3, D).

From the severely infected Chinese Ching dog, two morphologically distinct cultures were obtained. The first, 2A, was similar to the usual culture of *T. mentagrophytes* as described above. The second, 2B, was unusual for it was heavily folded and its surface, resembling the convolu-

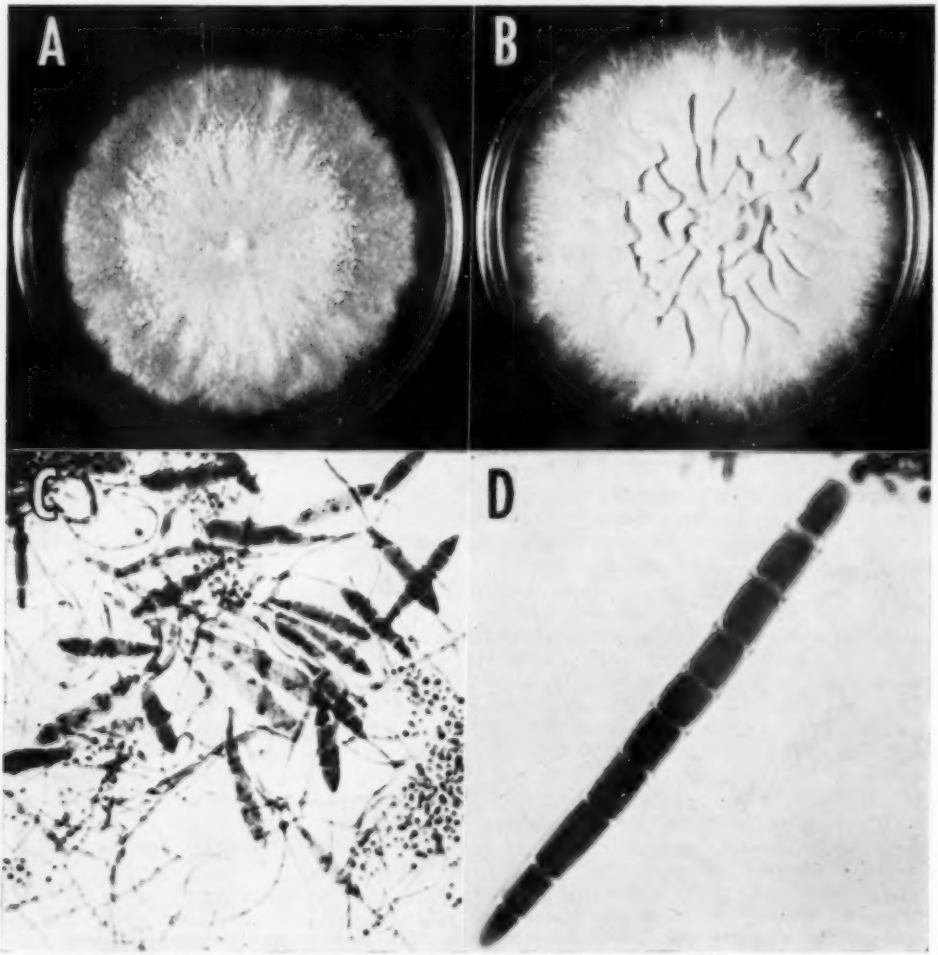

Fig. 3—Granular-type Trichophyton mentagrophytes culture (A); downy, folded, T. mentagrophytes culture (B); organisms showing its typical appearance with the clavate, several-celled structures with their smooth walls (C), x 522; long, slender macroconidium (D) seen in some isolates, x 970.

tions of the brain, was covered with a fine, white, downy, aerial mycelium. (fig. 3, B). Microscopic examination revealed similar structures, as observed in the typical strain above. Thus, both a granular and a downy type culture of *T. mentagrophytes* were obtained from this animal. Both cultures 2A and 2B have remained stable in their morphological characteristics over a period of three years.

Experimental Animal Infections.—Culture 2A and three other typical granular colonies of *T. mentagrophytes*, as well as culture 2B, the unusual downy colony, were inoculated into pups.

Four pups, including short- and long-haired mixed breeds, were inoculated with granular colonies. The first evidence of infection, observed by the seventh day, were erythema and scaliness; skin scrapings showed the presence of mycelium. Hair invasion occurred from the seventh to the fourteenth day, with typical ectothrix invasion of *T. mentagrophytes* (fig. 2, C). In general, the maximum tissue reaction was observed between the twentieth to the thirty-fifth day (fig. 2, D). Crusts formed were at first tightly adherent but later became dry and flaky and were scratched off by the animals. All lesions appeared to be healed by the fortieth to the fiftieth day; however, they still yielded cultures.

Two pups were inoculated with culture 2B (from the Chinese Ching dog, fig. 1, C). Slight scaliness was observed by the seventh day, and skin scrapings showed branched mycelium. Heavy crusts were observed by the fourteenth to the twenty-first days. Hair invasion was apparent by the twenty-first day; however, complete development in the hairs was never obtained. Infected hairs showed strands of branched mycelium in their interiors but the sheath of arthrospores characteristic of infections due to *T. mentagrophytes* was never produced. Spontaneous healing was apparent by the thirtieth day and, after this time, the fungus could no longer be recovered by culture.

Trichophyton mentagrophytes Ringworm in the Cat.—Two cases of *T. mentagrophytes* infections of cats were observed. One occurred in a Persian cat and the other in a domestic short-haired cat (fig. 4).

Loss of hair and scaliness in circular areas was apparent on both animals. The

Fig. 4—Trichophyton mentagrophytes infection on the paw of a domestic, short-haired cat.

lesions were scattered on various areas of the body but the heads, legs, and tail were chiefly involved.

Laboratory findings were similar to those described under *T. mentagrophytes* infections of the dog. Both cultures isolated were of the granular variety.

DISCUSSION

The finding of 18 infections due to *T. mentagrophytes* among 254 cases of ringworm in dogs suggests that this fungus is an important cause of canine ringworm. Many of the infections are minimal and cultures are infrequently made from animals suspected of having ringworm. This may account for the few cases of this type of infection in the dog recorded in the literature. Since hairs infected by *T. mentagrophytes* do not fluoresce under a Wood's light, it is obvious that its use is not appropriate for the detection of all types of ringworm infections. Only microscopic examination of clinical materials followed by cultural studies will allow determination of the fungus agent involved.

The finding that *T. mentagrophytes* commonly infects rodents[3] suggests that either direct or indirect contact with these animals may be an important source of infections in dogs and cats.

SUMMARY

1) Eighteen *Trichophyton mentagrophytes* infections in dogs and two in cats have been described.

2) It is suggested that these infections

are not uncommon in these animals, even though only a few cases have been recorded in the literature.

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True and False Ringworm in Swine

Trichophyton mentagrophytes skin infection was reported, for the first time in England, in White hogs 5 to 6 months old. There was considerable pruritus. The lesions appeared as rounded patches of golden-tinted hair on the thorax and flanks and as small, red, circular areas on the neck and sides of the trunk. The two largest lesions were 5.0 by 3.5 inches posteroventral to an ear and 3.0 by 2.0 inches on the medial surface of a stifle; they were covered by thin, brownish, dried crusts and, when scrubbed, showed many red, upstanding hair follicles. (The epidermis was occasionally infiltrated with cells, chiefly eosinophils, while the dermis was infiltrated chiefly with lymphocytes or fibroblasts.) The lesions disappeared in six weeks without treatment. Two of 3 contact pigs developed a few small areas of infection; the pruritus lasted about two weeks. Since no hair was shed, the chief signs of this true ringworm were pruritus, the golden-tinted hair, and the brownish crust.

Pityriasis rosea in pigs resembles ringworm in man and is often erroneously so described. It forms circular, slowly expanding lesions, with raised reddish margins, which occur chiefly on the medial surface of the thigh, on the posterior belly region, and in the axillary spaces. There is no pruritus and fungi could not be demonstrated culturally or histologically from a number of cases.—*E. A. McPherson in Vet. Rec., Oct. 13, 1956.*

[Hutyra, Marek, and Manninger (5th ed., Vol. III, p. 598) state that pityriasis rosea occurred in suckling pigs 5 to 8 weeks old, associated with a slight general disturbance, with recovery after two to three weeks. The slightly raised, bluish red patches started as minute papules, then expanded; the centers became pale, desquamated, then healed. No fungus was found and attempts to inoculate pigs and dogs were unsucccessful. This condition has been common in the cornbelt and has affected pigs several months old without any general disturbance being noticed. There is no pruritus, and the lesions disappear spontaneously in a few weeks.—W.A.A.]

Uses for Hyaluronidase.—Since hyaluronidase enhances the permeability of tissues, it may increase, more than 100 per cent, the diffusion and absorption of injectable fluids to which it is added. When added to a solution of penicillin to be infused, in early stages of mastitis, it accelerates recovery. When added to a local anesthetic, a wider area is affected and more rapidly; for paravertebral use, the anesthesia is more even. When added to certain immune serums, a higher antibody level is achieved more rapidly. When tested on mice, antierysipelas serum containing hyaluronidase was as quickly effective when given subcutaneously as was the same dose when given intravenously without hyaluronidase.—*Monatsh. f. Vet.-med. (Feb. 1, 1957): 59.*

The Veterinarian's Place in Disaster and Civil Defense Emergencies

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ON THE MORNING of Aug. 19, 1955, Dr. Raymond B. Church, who owns an animal hospital in Winsted, Conn., came face to face with disaster. A hurricane-caused cloudburst had flooded the Mad River, which runs through Winsted, and had cut the town in two. Dr. Church and another veterinarian were the only people with medical training on the east side of town.

State police sent him a message. They wanted drugs—"penicillin, tetanus toxoid, anything you have." Dr. Church made available the drugs in the animal hospital, which stood above the flood. He was called to attend an aged man with a cardiac condition who had been eight hours in water up to his chin. The man was moved to a convalescent home in the next town, where arrangements were made for medical care. The animal hospital was opened for first aid for man and emergency treatments until the next day, when disaster headquarters were established in a school building. Dr. Church then provided the center with medical supplies—cotton, gauze, sponges, syringes, and sterilizers. Until adequate medical help arrived, he assisted in administering typhoid vaccine.

When the flood receded, new problems arose in which a veterinarian could help. Dr. Church assisted in canvassing the water and sewage situation and the health hazards in flooded eating places. Unfit food was condemned and disposed of, and cleaning and disinfection of eating establishments was carried out—all under the supervision of a veterinarian. Dr. Church, while inspecting emergency feeding establishments, found that dishes were being washed with a scant supply of water, and furnished quaternary ammonium compounds to disinfect them. He found that 500 qt. of raw milk had been delivered. It was sent to a nearby pasteurizing plant before its use was permitted. Veterinarians assisted in handling pressing problems of sanitary water supply and sewage disposal. They forestalled an order to destory pet animals, temporarily abandoned, by arranging the use of animal hospitals as temporary pounds until owners were able to recover the pets.

This report, borrowed from Dr. Church's article in the May 15, 1956, JOURNAL, is just one example of what a veterinarian can do in time of disaster. It could happen anywhere.

THE NATURE OF EMERGENCIES

Emergencies may be brought about by natural causes, like this tropical hurricane that hit New England. They call for veterinary participation in casualty and public health services. Another kind of emergency that we must face and prepare for is a national emergency in terms of the ABC's of modern warfare—atomic, biological, and chemical.

The country's defense authorities agree that any war of the future will most likely appear as a sudden attack on metropolitan and industrial centers, with nuclear missiles as the principal weapons and the civilian population as the main target. Defense will consist, not of embattled farmers barricaded behind fences and hedgerows and exchanging fire with advancing land armies, but of a struggle for survival, as a people, in order to back up the nation's counterblows from military bases here and abroad.

Modern warfare, like disease, is no respecter of persons, boundaries, or localities. It can strike anywhere and affect anyone. Cities, rural communities, farms, and ranches can feel the blight of any future war. Conceivably, entire cities can be destroyed. Casualties may be counted in thousands or even in millions. If warning time permits, many people probably could be evacuated from urban to rural areas. Also, deadly radioactive fall-out from nuclear weapons can affect great areas, whether rural or urban.

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Emergency activities to which veterinary medicine can contribute are, largely, extensions of peacetime responsibilities. The basic responsibility of the profession is to safeguard the nation's supply of animal-derived foods. This includes disease-prevention measures, such as inspection and quarantine, to prevent the entry and passage of disease across boundaries. It includes remedial measures, such as the treatment of animal diseases and the research necessary to make this work increasingly effective. It includes organized efforts to control and eradicate the more serious infectious diseases, among which are a number common to both animals and man. It includes meat inspection, the purpose of which is to assure that foods of animal origin are sanitary and wholesome. In all of these activities, the veterinarian is so trained that he can add significant skills and services in either a peacetime or wartime emergency.

ATOMIC WARFARE

National policy recognizes that the civilian populations of critical target areas should not, if it can be avoided, be exposed to the direct thermal blast and initial radiation effects of nuclear weapons. Dispersion of the target area population into rural areas is, therefore, an important part of a defense plan.

Casualty Service.—The survival problem must include the care of large numbers of injured persons and larger numbers of evacuees whose homes have been destroyed or whose home areas have been made uninhabitable by exposure to radiation. Veterinarians in urban areas would have an initial responsibility to help physicians care for casualties in man. This assistance would be especially necessary immediately after an attack in which the number of casualties would overwhelm the available medical personnel. At such a time, every medically trained person in the area would be needed. Veterinarians, like dentists, can function in an auxiliary capacity at first-aid and other stations or, like Dr. Church, they can also provide medical and surgical supplies and assist in many paramedical duties.

Public Health Services.—Defense plans must include preparations to prevent disease and death from striking the surviving population because of communicable and noncommunicable diseases, lack of food, radiation hazards, and many other public health problems that arise from emergency concentrations of large groups of displaced persons.

Civil defense planning includes the movement of people from large metropolitan areas to reception centers some distance from the target area. The emergency movement and concentration of displaced persons will pose many public health and sanitary problems in the rural areas where these people are placed, areas that may not be equipped or geared, sanitarily and otherwise, to receive them. The veterinarian, with his medical background, his knowledge of the health conditions of livestock in the area, and his understanding of standards and requirements of a safe environment, can provide important and much-needed supervisory services in these areas.

Water in closed containers, including pipes and plumbing fixtures, does not become dangerously radioactive from atom bombs and may be used. *Boiling* does *not* make water, contaminated with radioactivity, safe for use, but it was found at Bikini that *distilling* made it perfectly safe to drink.

Foods that are well packaged and sealed, or in metal containers, are safe to use. Such containers, if covered by a dry, dustlike fall-out, may have to be cleaned, by mechanical brushing or air from a pressure hose, before the food in them can be safely used. Metal food containers can also be decontaminated by thorough washing with soap and water. Unprotected perishable foods containing high levels of radioactive materials can not be utilized, whereas nonperishable foods may be set aside until natural decay decreases the amount of radioactivity to acceptable quantities.

The usability of water and food must be decided by civil defense radiological services following tests of such supplies.

Only a few years ago, a relatively few persons, radiologists, and a small number of physicists, were in a position to be injured by radiation, and exposure to radioactive fall-out in livestock was unheard of. The ever-growing atomic energy industry of today has increased the number of persons who could be injured by radiation to many thousands, and the concern of the livestock raiser relative to the possible effects on his animals from radioactive fall-out has proportionately increased.

Although remarkably few radiation injuries have been recorded to date, in spite of the rapid expansion in this field and the huge quantities of radioactive material handled, it is essential that every medical scientist, including physicians, veterinarians, and professional students, become conversant with the biological effects of ionizing radiation and the diagnosis and treatment of the various types of radiation injury in both their acute and chronic or late manifestations. This is important in the field of veterinary medicine in order that the practitioner can reassure his clients either that signs of illness that appear in livestock are not due to radiation or, if exposure has occurred, that no overexposure has taken place.

There seems to be a tendency to attribute certain illnesses of livestock to the effects of radioactive fall-out if they are in the locality of an atomic energy plant or near atomic testing sites, or if anyone with a Geiger counter, such as a physics teacher out on a hike, observes a slight activity in his monitoring gadget.

Radiation injury has been excluded a few times by observing that a mere barbed wire fence separated an apparently healthy herd of animals from the reportedly injured group.

Fall-Out.—When a nuclear weapon explodes, two kinds of atomic radiation occur. The first is effective immediately and contains the neutron and *gamma* rays which are released instantaneously with the explosion of a large weapon on or near the ground. It does not present a serious hazard beyond the area of heat and blast injury.

The second is slower and is made up of a residual radioactivity produced by a detonation (as opposed to the immediate nuclear radiation). It may settle over an area much larger than that affected by blast and heat, over a longer period of time, and has been aptly named "fall-out." All nuclear detonations produce radioactive materials but the nature and extent of the radioactive fall-out depends on the conditions under which the bomb is fired. The main radioactivity of a bomb's fall-out decreases very rapidly with time—most of it within a few hours after the detonation.

When the bomb is exploded in the air and the fireball does not touch the earth's surface, the radioactivity produced in the bomb condenses only on solid particles from the bomb casing itself and on the dust in the air. These minute substances may settle to the surface over a very wide area—probably spreading around the world—over a period of days, or even months. But they descend extremely slowly and by the time they have reached the earth's surface the major part of their radioactivity has been dissipated harmlessly in the atmosphere.

If, however, the weapon is detonated so that the fireball touches the surface, large amounts of material will be drawn up into the bomb cloud and the particles, heavy enough to descend rapidly, will still be intensely radioactive. The result is a comparatively localized area of extreme radioactive contamination and a much larger area of some hazard.

Fall-out can be a serious hazard to communities that are miles away from the initial bomb blast. After a thermonuclear test at the Eniwetok proving ground in 1954, it was estimated that sufficient radioactivity existed in a downwind belt 140 miles in length and varying in width up to 20 miles to have seriously threatened the lives of nearly all people in the area who did not take protective measures. Fall-out is usually quiet and invisible and can be detected only with special monitoring instruments. Very little information on this problem is available, as yet, to the veterinary profession.*

The simplest and most effective way to reduce the hazards of fall-out is protection by shelter, both for human beings and animals. A cardinal principle of dealing with radiation is that it is more easily handled when outside than when inside the body. Barns or farm buildings that are reasonably well built provide shelter for the feed as well as for the animals. The hazard, both to people and animals, increases two or three days after fall-out, when available sources of uncontaminated food and water may become increasingly scarce.

It can be expected that milk from cows which have ingested contaminated feed and water will contain radioactive elements.

*A publication entitled "Defense Against Radioactive Fallout on the Farm," has been prepared by the U. S. Department of Agriculture in cooperation with the Atomic Energy Commission, U. S. Public Health Service, and Federal Civil Defense Administration. It should be available in the near future.

Here, one must be guided by the conditions; the degree of contamination must be weighed against the need for food. The dietary importance of milk to infants and children, and their greater susceptibility to radiation effects, make milk a most critical animal food product in case of radiation exposure. Under these circumstances, canned or powdered milk should be a safe substitute.

Food-producing animals, including poultry, do not readily accumulate radioactive materials in their muscle tissues. Therefore, if the meat is not contaminated from the skin or from the internal organs, which may have become radioactive from ingestion of contaminated materials, it may be safely eaten.

The civil defense Operation Alert of 1956 pointed up some of the problems associated with fall-out. A first attempt was made to prepare a "minimum necessary exposure schedule" for persons responsible for the care of livestock during the first month. This schedule should be extended for livestock handling and for crop care. These schedules must be based on the intensity of fall-out in different zones, effects of radiation on human beings of different ages, and other factors. Standards of radiation damage to livestock are needed, including the kind of animal, its age, type, size, nature of product (meat, milk, eggs, etc.), fall-out intensity zone, effectiveness of shelter, and other considerations. But basic research is lacking to fill in all the requirements of such standards. The danger of radiation to workers with both animals and agricultural crops is involved in considering how to handle these matters. Animals exposed to heavy fall-out, and crops ready to harvest, may have to be discarded, at least until research furnishes exact knowledge of the medium- and long-time hazards associated with crop contaminants and methods of decontaminating crops and foods.

BIOLOGICAL WARFARE

Biological warfare could be a serious threat to the livestock of this country. Under modern conditions of livestock marketing and rapid transit, highly communicable foreign diseases, some of which show signs similar to diseases already present, might spread widely before being recognized.

Federal and state livestock disease regulatory officials are organizing emergency animal disease control and eradication programs that can be put into instant operation if and when dangerous exotic diseases appear. Steps have been taken to inform the veterinary profession of some of the characteristics of foreign animal diseases that are the greatest potential threats. The U. S. Department of Agriculture and other agencies have also taken steps to inform farmers and livestock owners about foreign diseases; they have been urged to call their veterinarian or a regulatory official when any unusual animal disease appears.

The veterinarian will have to meet this threat. He needs to know everything he can learn about serious foreign diseases in the event that they occur, whether as a peacetime or wartime threat. Fortunately, there are a number of veterinarians in the United States who have had experience with these diseases; they can be extremely helpful should an emergency arise.

CHEMICAL WARFARE

Chemical agents can be used to produce casualties, make areas impassable, start fires, and contaminate food and water. Chemical warfare would be directed against groups and serve as part of a larger strategy.

Unprotected food and feeds might be so contaminated that their consumption would produce systemic poisoning or irritation of the alimentary tract. Canned foods and packaged foods in storage are not likely to be seriously contaminated. Chemically contaminated foods should be handled only by persons trained in decontamination methods and equipped with protective clothing and gas masks.

"Nerve gas"† is one weapon that might be used in all-out chemical warfare. The practicing veterinarian may be confronted with livestock which have been accidentally exposed to or have consumed considerable amounts of some of the modern insecticides. The physiological effects of nerve gas on animals are similar to those produced by the accidental exposure to or consumption of some of the organic phos-

†Nerve gas is a war gas developed prior to World War II as a result of research conducted on insecticides by German scientists. These toxic agents known as anticholesterase agents can enter the body through the respiratory system, although they are not lung irritants, or through the skin, although they are not vesicants and do not attack the skin. Their ultimate action is the paralysis of the central nervous system.

phorous insecticides; the antidotes are, likewise, the same.

SUMMARY

Experience in recent disaster emergencies indicates that the veterinarian will be expected to devote his professional talents and technical training in times of extraordinary stress. It is his responsibility to not only respond but to find out how he can best respond to these calls. Nearly every community has one or more organizations set up to deal with emergency conditions. The veterinarian should seek them out before the need arises and offer his help so he can be integrated into the team of medical and allied skills.

A flood, earthquake, extensive fire, or devastating storm may call emergency organizations into action. Atomic warfare, biological warfare, and chemical warfare would impose almost superhuman demands upon every segment of the population.

The veterinary profession is a public service profession. It has always been ready and willing to serve in case of need. Today, the potential threats and crises are so appalling, and require so much foreknowledge and planning, that every veterinarian should volunteer his services before the need for them arises.

Short Reports on Zoonoses

Tularemia.—Four persons working in a rabbit-skinning plant in Colorado developed tularemia. Agglutination tests for *Pasteurella tularensis* in two patients was 1:160 and 1:320. The rabbit skins are sent to commercial processing plants; the meat is frozen, and sent to processors of small animal foods.—*Feb. 22, 1957.*

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Pasteurella Multocida Infection.—A woman in Connecticut, bitten on the ankle by a cat, developed a persistent lesion and an abscess. A skin test was positive for cat scratch disease and, when opened, *Pasteurella multocida* was cultured from the abscess. This is the second known human case of abscess formation due to this infection following a cat bite.—*March 1, 1957.*

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Infectious Encephalitis.—During 1956, on laboratory diagnosis of 560 persons with acute encephalitis, 14 had the western equine encephalomyelitis and 7 the St. Louis type. Of 1,000 pools of mosquitoes tested, 143 yielded WEE virus and two the St. Louis virus. The WEE virus was isolated from 4 of 124 squirrel brains. Only 6 cases in horses were confirmed.—*March 22, 1957.*

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Rabies.—Laboratory confirmation of rabies was obtained in Michigan in (1) a large brown bat which died after biting a boy; (2) a cow imported from Missouri; and (3) a pet skunk obtained by mail order. The skunk had been trapped in a rabies-infected area in Texas, de-scented, and shipped to Michigan with a health certificate. Three persons it had bitten were given antirabies vaccine.—*March 29, 1957. —From Pub. Health Serv., U.S. Dept. of Health, Education, and Welfare, Washington, D. C.*

Effect of Soil on Tetanus Incidence.—A survey in southern Germany (1951-1953) indicated regional differences in the frequency of tetanus. A study of soil character suggested that, in sandy soils, the tetanus spores easily penetrate to deeper layers, whereas in fine granular soil (loam), they remain near the surface. In Germany, the disease occurred four times as frequently in areas with the loam soil as in areas with a sandy soil. In Poland, it occurred ten to 20 times more often in loam regions than in sandy regions.—*Prakt. Tierarzt, Jan. 1, 1957.*

Hydatid Disease in Australia.—Observations on dogs in New South Wales, 52 at necropsy and 524 treated with arecoline hydrobromide, revealed the following percentage incidence of echinococciasis granulosa; farm house dogs, 31.6; sheep dogs, 29.7; cattle dogs, 27.3; "rabbiting dogs, 19.1; dogs at rural abattoirs, 38.1; at a metropolitan abattoir, 14.0; and city dogs, 3.8.—*M. A. Gemmell in Austral. Vet. J. (Jan., 1957): 8.*

A New Pathogen in Ovine Mastitis.—A small gram-negative bacterium, apparently not previously described, was isolated from the udder of a ewe with severe mastitis. Cultures injected into the udders of 2 dry ewes produced acute mastitis. Since special methods were needed to isolate the organism, this infection may have occurred previously and been wrongly diagnosed, possibly as a Staphylococcus. The name *Histophilus ovis* is suggested.—*D. S. Roberts in Austral. Vet. J. (Dec., 1956): 330-332.*

Fluorescent Antibody Technique in Veterinary Research

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THE FLUORESCENT antibody technique, as developed by Coons and his co-workers, has opened new avenues of research, combining the disciplines of histochemistry and immunology. By this method, the exact site of a pathogenic microorganism, or any given specific antigenic material, can be detected in tissue sections, imprints, or smears.

The principle on which the technique is based is the linkage of a dye molecule to the still functional antibody molecule.[1] This principle has been exploited by Coons[2-4] who has used fluorescein isocyanate as the conjugated dye. While the principle is simple, the technique entails an exacting biochemical process in the preparation of the fluorescein isocyanate through intermediate steps of nitrofluorescein and aminofluorescein.[2-4] The fluorescein isocyanate is then coupled to the partially purified globulin precipitated from an immune serum which is specific for the antigen to be detected to produce the active reagent or conjugate.[3,4]

The conjugate is then reacted with tissues prepared either by means of frozen sectioning in a freezing chamber, the cryostat, or by means of smears or imprints. If the tissue contains an antigen specific to the antibody in the conjugate, antibody-antigen linkage occurs and the fluorescent dye is fixed at the site of the antigen. This enables the visualization of the antigen by means of microscopy by ultraviolet illuminations.

The method has been used to study the behaviour of polysaccharide and protein antigens in the animal body.[3,5,6] It has been successfully employed for specific disease antigens: mumps virus in the salivary gland, brain, and spinal cord[7,8] and in infected chicken embryo tissues[9,10]; influenza in chicken embryos[11] and in ferrets[12,13]; epidemic typhus and Rocky Mountain spotted fever[7]; atypical pneumonia[14]; leptospiras in human muscles[15]; varicella in tissue culture[16]; and for distinction of *Endamoeba histolytica* from *Endamoeba coli*.[17]

In addition to the direct method of employing fluorescent antibody, two adaptations called "layering" have been employed. One method consists of exposing the section alternately first to specific unlabeled antigen and then to labeled antigen. This method has been employed to show the location of antibody within the tissue.[22] The other layering technique consists of the use of labeled antiglobulin serum as an indicator of a reaction between the antigen in the tissue and its specific antibody.[14,16]

Fluorescent antibody has been employed in the study of infectious canine hepatitis[18] in which it was shown that the typical intranuclear inclusion body of this disease contained viral antigen and that a definite sequence of invasion of the nucleus took place consisting of (1) invasion of the nuclear membrane and (2) gradual accumulation of viral particles in the nucleus which, by a process of coalescence, developed into the typical inclusion body.

It has also been employed in the study of canine distemper on smears of urinary bladder, showing the specificity of the inclusion bodies,[19] and in the brain where the presence of specifically fluorescent antigenic material has been demonstrated in astrocytes within foci of demyelination.[20] A detailed study of the pathogenesis of the disease has been made in experimentally infected ferrets.[21-23] Following intranasal inoculation in the ferrets, the viral antigen was detectable within two days in the cervical lymph nodes. Subsequently, the viral antigen was detected in the mediastinal and mesenteric nodes, the spleen, the Kupffer cells of the liver, and the leukocytes of the blood. Within one week after infection, viral antigen appeared in the epithelial cells of the stomach, intestine, and skin.

The viral antigen first appeared as fine granules which later aggregated to form fluorescent masses in the cytoplasm or the

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nucleus, resembling typical distemper inclusion bodies.

Examination of smears of the peripheral blood revealed specific fluorescent granules within leukocytes, diagnostic of canine distemper, as soon as gross symptoms of infection were detectable in the animals.

Application of the method to naturally infected dogs has shown findings similar to the ferrets.[21,24] However, there were differing degrees of involvement in various organs. The brain of the dog has been particularly interesting, when studied by this method, where viral antigen was detected in the form of fluorescent granules or oval masses in the cell bodies of neurons and their processes, as well as the ependymal cells and astrocytes. Early in the sequence, the presence of viral antigen has been shown in the blood vessel walls in the brain before invasion of the nervous tissue itself had taken place.

The fuschinophilic inclusion bodies were found to contain stainable viral antigen. However, the red-staining inclusions from Shorr's triple stain (S-3) frequently were not stainable by fluorescence, suggesting that the inclusions best shown by S-3 were the later stages which had lost their antigenicity.

Fluorescent antibody has been found to be a practical diagnostic method when applied to conjunctival smears from living dogs in the febrile stage of the disease. Postmortem diagnosis, also, is easily accomplished either from frozen sections or by examination of imprints prepared from the urinary bladder, spleen, lungs, or other organs.

SUMMARY

The use of fluorescein-labeled antibody as a histochemical technique to detect an antigenic agent is a practical, specific research tool. It is conveniently employed to elucidate the finer aspects of pathogenicity of infectious diseases, as well as basic studies concerning the formation of antibody.

In the veterinary field, it has been employed to study infectious hepatitis of dogs and canine distemper. It undoubtedly will prove useful in many other phases of veterinary research and for disease diagnosis.

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Studies on Bluetongue

Most of the developmental history of immunization against bluetongue took place in South Africa. When confronted with the problem of developing a bluetongue vaccine for use in the United States, it was decided to use American rather than South African strains of virus, but to follow essentially the procedure employed in South Africa in preparing the vaccine.

Two California strains of virus were attenuated by serial passage in chicken embryos. The progress of attenuation was followed by titrations in chicken embryos and by virulence tests in sheep. When the virus was considered to be attenuated, a freeze-dried batch of each strain was prepared on a commercial scale basis.

Tests in sheep demonstrated that each strain was immunogenic, safe to use in that neither showed any tendency to revert on serial passage, and that the two were immunologically identical. However, in the event that slight antigenic variations might exist between them which could not be detected by the method of testing used, both strains were incorporated in the experimental vaccine that was prepared for large scale field testing. The field trials preceded the issue of the vaccine for general use.—[*D. G. McKercher, Blaine McGowan, Jr., V. J. Cabasso, G. I. Roberts, and J. K. Saito: Studies on Bluetongue. III. The Development of a Modified Live Virus Vaccine Employing American Strains of Bluetongue Virus. Am. J. Vet. Res., 18, (April, 1957): 310-316.*]

A New Ovine Ringworm.—A strain of macrospore dermatophyte, identical with *Trichophyton verrucosum* var. *ochraceum*, frequently found in ringworm lesions of cattle in France, was reported for the first time in sheep in a flock badly infected with internal parasites and contagious ecthyma. Lesions were limited to the head and healed within four or five weeks.—*Bull. Acad. vét. France (Nov., 1956): 443.*

Ringworm on Unusual Hosts.—*Trichophyton verrucosum* var. *discoides* was found, for the first time in Britain, on 2 dogs—a Spaniel with an itchy, scaly patch on the side of the thorax; and a Collie pup with bare areas on its head and shoulders. Of 100 cases examined in cattle in the past four years, 99 were *T. verrucosum*, and 1, on a bull calf with typical ringworm, was *Trichophyton mentagrophytes*. This is the second such case recorded in cattle in Britain.—*Gentles and O'Sullivan in Vet. Rec. (Feb. 16, 1957): 132.*

Leptospira Pomona in Birds.—Feeding diluted urine from a heifer with leptospiruria produced a positive agglutination-lysis test for *Leptospira pomona* in 4 of 6 cockerels, 2 of 3 partridges, 1 of 8 ducks, and both of 2 pheasants. Leptospiras could not be demonstrated in the feces of the infected birds.—*Poult. Sci. (Jan., 1957): 110.*

Antigenic Power and Virulence.—A study of several strains of *Bacillus anthracis*, varying from almost apathogenic to highly virulent, indicated no relation between the virulence and pathogenic power. It may be possible to produce effective vaccines with relatively apathogenic organisms.—*Acta Med. Vet. (Sept.-Oct., 1955): 310.*

Bovine Hyperkeratosis in Israel.—Bovine hyperkeratosis occurred on farms, in Israel, where machinery had been greased with a lubricant containing 3 per cent penta- and hexa-chloronaphthalene. Two calves, experimentally poisoned with the lubricant, developed typical signs and lesions.—*Vet. Bull. (March, 1957): 144.*

Surgery and Obstetrics
and Problems of Breeding

A Report on a Five-Year Study of Fracture Repair by Permanent Intramedullary Pinning

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THIS REPORT concerns the end results of treating fractures in dogs and cats by permanent intramedullary pinning during the past five years. All were the results of accidents, and the animals had the attendant conditions of shock, muscle damage, neglect, and additional circumstances seen with such trauma in daily practice.

The methods used were those previously described.[1-3] In other reports, permanent placement of intramedullary pins has been proposed,[4,5] done on occasion,[6] or done inadvertently.[7] In the cases here reported, the pins were routinely so placed. The pin is of 18-8-303 stainless steel and can remain permanently in the body.[8]

In brief, the procedures were as follows: In fractures of the femur and humerus, an open reduction was performed and a pin of predetermined length and diameter was driven up the medullary cavity of the proximal fragment through to the outside. Alignment of the fractured ends was made by angulation, and the pin was then driven retrograde into the marrow cavity of the distal fragment. A pin setter was used to drive the proximal tip of the pin beneath the cortex of the bone. On occasion, this procedure has been done in fractures of the tibia.

Fractures of the distal portion of the radius and ulna, or of the tibia, were

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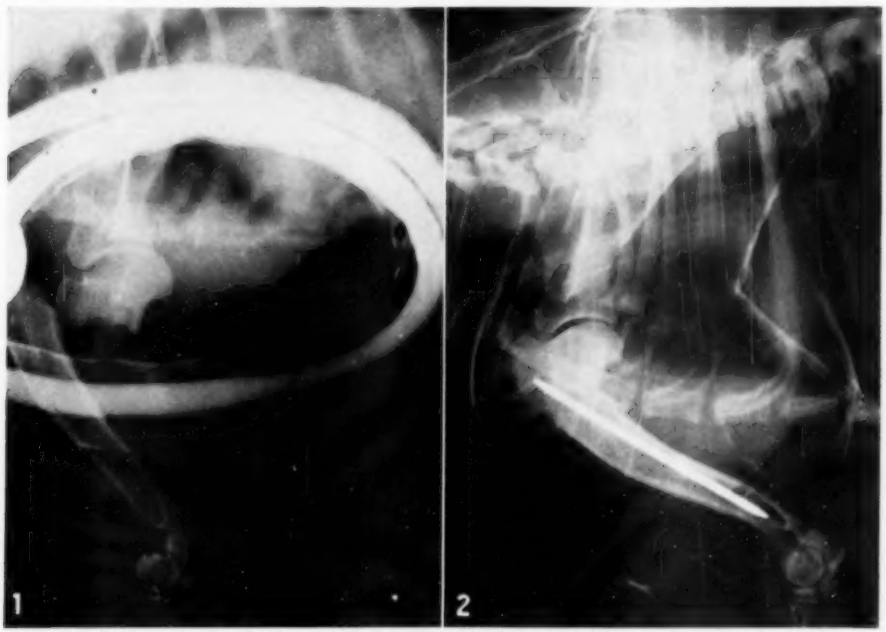

Fig. 1—Radiograph of a fracture of the left humerus of a dog before treatment with permanently implanted intramedullary pin.

Fig. 2—Radiograph of a fracture of the left humerus of a dog after treatment with permanently implanted intramedullary pin.

Fig. 3—Radiograph of the left humerus of the dog with permanently implanted intramedullary pin. There is no evidence of any change due to presence of the pin. Function is completely normal.

Fig. 4—Radiograph of a fracture of the midshaft of the left radius and ulna of a dog before treatment with permanently implanted intramedullary pin.

treated by placing a "Leighton shuttle pin" permanently in place. In an open reduction, the medullary cavities are drilled; the entire pin, with traction sutures attached, is inserted into the proximal fragment; and the bone is aligned by angulation. Traction is applied on the suture, drawing the pin into the distal fragment, thus bridging the site of fracture; then the suture is removed and a coaptation splint is applied. Fractures of the proximal portion of the radius and ulna were treated by inserting an intramedullary pin into the ulna through the olecranon.

From December, 1950, to the end of 1955, 110 animals were treated by some form of permanent intramedullary pinning. Reports on the results in 64 of the 110 were obtained. The reports were often based on the owner's opinion. Owners are usually fairly critical and are in a position to observe their pets daily. Many of these animals were brought in for observation and radiographs were taken of several (fig. 1-6).

Of the 64 animals on which reports were received, the results were good in 54, fair in 3, and poor in 7. Those reported as good gave no evidence of lameness, discomfort, or retardation of activities. Many of the dogs are used in hunting. Some have slight enlargements at the site of fracture. Those reported as fair show a slight limp but are otherwise satisfactory. The following short histories indicate the reasons for some of the poor results.

CASE REPORTS

Case 1.—A female Collie, 2½ years old, was presented with a fracture of the left radius and ulna, with nonunion of at least one month's duration. The bone ends were prepared and intramedullary fixation was applied but no union occurred. After two months, the pin broke, due to metal fatigue, and the dog was destroyed.

Case 2.—A male, mongrel Shepherd, 9½ years old, had a fracture of the right radius and ulna with nonunion for seven

weeks before being presented. There was no evidence of callus formation. Attempts at stimulation of healing and intramedullary fixation were unsuccessful and the leg was amputated.

Case 3.—A male Doberman Pinscher, 3½ months old, was submitted with a fracture of the left humerus. The fracture healed well but the leg was paralyzed. The dog was destroyed. This emphasizes the necessity of neurological examination in such fracture cases.

Cases 4 and 5.—In 2 dogs with fractures of the left femurs, it became necessary to remove the pins since they moved out of position up into the area medial to the trochanter. Inflammatory reaction to the movement of the extended portion of the pin in the musculature brought about pressure on the sciatic nerve, causing intense pain. This movement was probably due to failure to sink the pins below the trochanteric fossae. Both animals recovered satisfactorily.

Fig. 5—Radiograph of the midshaft of the left radius and ulna after treatment with permanently implanted pin.

Case 6.—A male Boxer, 9 months old, with a fracture of the right femur, had considerable shortening of the leg because a large fragment of the midshaft was removed when the fracture was repaired. Healing was adequate but the dog was destroyed since it did not use the leg. It might have been possible to preserve more of the length of the leg if the large fragment of bone had been retained.

Case 7.—A male Collie, 7 years old, with a fracture of the right femur, was released to the owner and taken to Florida before healing was complete. The only history is the report of an unsatisfactory outcome by the owner.

Comments.—In no instance was infection the cause of an unsatisfactory result, even though the pins were placed, in some

Fig. 6—Radiograph of the radius and ulna of a dog five years after the fracture occurred. The leg is normal and no evidence of change due to presence of pin has occurred.

cases, in the presence of infection. Antibiotics were given in all instances. One animal developed a generalized periosteal thickening over the entire shaft of the affected femur but there was no evidence of abnormality, except that revealed in a radiograph. Of particular interest was the absence of any difficulty ascribable to the presence of the stainless steel. In those cases coming to necropsy at a later date, the pin was bright, clean, and free of any evidence of corrosion.

SUMMARY

A review of the results of permanent intramedullary pinning at the Rowley Animal Hospital over the last five years was made. Of the 110 animals treated, reports were available on 64. Of these, 54 were considered to have good end results, 3 were fair, and 7 were poor. In no case was any difficulty ascribed to the presence of the stainless steel itself.

CONCLUSION

It is felt that the application of a permanent intramedullary pin is a safe and satisfactory method of treatment of selected cases of fractures of the long bones in dogs and cats.

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Collecting and Evaluating Ram Semen.—Semen evaluation of rams in the field is practical if it can be collected easily and rapidly. Rams are ear-tagged for identification, placed in a raised stock with one assistant to hold the electrode in position and to restrain the hindquarters. The electrode is dipped into a lubricant (5% gum tragacanth) and inserted in the rectum to a depth of 10 inches. The current (10 volts for A.C., 6 volts for battery) is controlled by the collector by means of a foot switch. Stimuli (4 sec. each) are given at intervals of three to five seconds. Semen usually appears after two to five stimuli; if not, the voltage may be increased. For routine examination, a single drop is collected on a slide. For insemination, the penis is withdrawn manually prior to stimulation and the ejaculum caught in a tube. A sample was secured in all of 253 attempts on 136 rams at an average speed of two minutes per collection.—*New Zealand Vet. J. (March, 1956): 20-22.*

Progress with Frozen Semen.—In the four years since the first calf was born in this country from insemination with frozen semen, half of the 80 breeding organizations have started freezing semen. Only one association in this country (Sheldon, Iowa) and one in Canada (Waterloo, Ont.) are using frozen semen exclusively. Both are operating satisfactorily but a few bulls have been eliminated because their semen was not satisfactory when frozen. About 15 to 40 per cent of sperm are killed during the freezing process.

Over 340,000 ampules of frozen semen are in storage in the United States, an average of 540 ampules from 633 sires. Nearly 27 per cent of the stored semen is from 68 bulls which are now dead.—*Hoard's Dairyman (March 25, 1957): 322.*

Electrical Induction of Estrus in Cows.—Estrus was induced, at the University of Illinois, in 6 cows which had shown no signs of heat for 42 to 166 days and in cows which had not yet been in estrus 50 to 60 days after calving, by using an electroejaculation apparatus inserted into the rectum in the vicinity of the uterus and ovaries. Palpation and slaughtering indicated that all had ovulated one to seven days after stimulation.—*J. Dai. Sci. (July, 1956): 920.*

Nylon-Replacement Arteries.—A Y-shaped nylon artery has been used in more than 200 persons to replace the diseased terminal portion of the posterior aorta.—*Sci. News Letter, Feb. 16, 1957.*

The Prevention of Anaplasmosis by Feeding Chlortetracycline

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SINCE ANAPLASMOSIS is transmitted only by insect vectors in nature, protection from infection is needed only during the time when the vectors of a given region are prevalent. Likewise, the period when protection is needed in feedlot operations is usually only two or three months in duration. Therefore, a method to provide protection from anaplasmosis for a few months each year would prevent much of the loss from this disease in most regions.

Preimmunization with *Anaplasma centrale* has been the only successful method developed to prevent lethal attacks of *Anaplasma marginale*. This method has disadvantages that have prevented its use in the United States. There have been many unsuccessful attempts to produce a satisfactory vaccine. One of these attempts concerned the attenuation of the infectious agent with antibiotics.[1]

Following a report on chlortetracycline (aureomycin®) therapy for anaplasmosis in 1951,[2] it has become generally agreed that the tetracycline antibiotics are of use against the infectious agent of the disease in cattle.[3-5] Since only a relatively short term protection is needed to prevent much of the loss from anaplasmosis, the authors were prompted to determine the protection afforded by continuous low level feeding of chlortetracycline.

EXPERIMENTAL METHODS

Fifteen yearling Hereford steers were placed in three lots of 5 animals each. The steers in lot 1 weighed 800 to 820 lb. with a mean of 808 lb.; those in lot 2, from 765 to 780 lb. with a mean of 772 lb.; and those in lot 3, from 700 to 860 lb. with an average of 759 lb.

Each group was placed in a drylot and the steers were fed the concentrate individually. In addition, a good grade of prairie hay was fed free choice to all steers.

Chlortetracycline (aureofac-10®) was fed by mixing it with a concentrate feed containing approximately 18 per cent protein, so that 1 lb. of the feed contained 100 mg. of chlortetracycline. One week after all 15 steers had been inoculated subcutaneously with 5 ml. of blood from long-time anaplasmosis carriers, each steer in lot 1 was placed on a daily ration of 8 lb. of this concentrate-chlortetracycline mixture. Each animal, therefore, received 800 mg. of chlortetracycline daily, or approximately 1 mg. per pound of body weight.

Likewise, a second lot of feed was mixed using 1 lb. of the feed containing 50 mg. of chlortetracycline or one half the amount of chlortetracycline contained in the first mixture, and 7.75 lb. of this meal was fed daily to each steer in lot 2, starting one week after experimental exposure to anaplasmosis. Each steer in lot 2 received 387.5 mg. of chlortetracycline daily, or approximately 0.5 mg. per pound of body weight.

Each animal in lot 3 was fed 7.6 lb. of the concentrate feed which contained no chlortetracycline. All of the steers were continued on these feeds for 60 days with minor adjustments in the rations for weight changes. Then they were placed on spring pasture without additional feed for 60 days and, at the end of this period, 100 ml. of blood from each steer in lots 1 and 2 was inoculated separately into 1 of 10 susceptible splenectomized calves.

Blood smears from each steer in lots 1 and 2, stained with Wright's stain, were examined daily during the first 60-day period and weekly thereafter. Blood smears, erythrocyte counts, and hemoglobin determinations were made on the steers in lot 3 daily until they were convalescent. An additional check for the presence of anaplasmosis in all of the animals was made at the start of and at weekly intervals throughout the experiment, by means of the complement-fixation test.[6]

RESULTS

The steers in lots 1 and 2, which received 1.0 and 0.5 mg. of chlortetracycline, respectively, and which were exposed to infection, did not become infected with anaplasmosis. None of 10 susceptible splenectomized calves that were inoculated with blood from the 10 cattle receiving chlortetracycline, 120 days after the experiment started, became infected with anaplasmosis. Blood smears made throughout the experiment did not show the presence of Anaplasma bodies. Erythrocyte counts and hemoglobin levels remained within normal ranges.

From the School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, in cooperation with the Oklahoma Agricultural Experiment Station.

The chlortetracycline, aureofac-10, and partial support for the experiment were furnished by the American Cyanamid Company, Pearl River, N. Y.

One animal in lot 1, which received 1 mg. of chlortetracycline per pound of body weight daily, showed a 4+ reaction to the complement-fixation test for anaplasmosis on the twenty-eighth day following inoculation. Serum from this animal became negative to the complement-fixation test on the thirty-fourth day and remained negative during the rest of the trial.

All of the cattle in lot 3, which received no chlortetracycline and which were exposed to infection, became infected with anaplasmosis. The range of maximum infected erythrocytes in these animals was 11.7 to 29.0 per cent, with a mean of 16.5 per cent. The lowest mean erythrocyte count of these cattle was 3.5 million erythrocytes per cubic centimeter of blood. These cattle first showed 4+ reactions to the complement-fixation test for anaplasmosis on the twenty-eighth day after inoculation, except 1 that became positive on the twenty-fifth day. All of these steers remained reactors throughout the remainder of the experiment.

DISCUSSION

These results show that it is possible to prevent anaplasmosis in yearling steers by feeding 0.5 mg. of chlortetracycline per pound of body weight daily for 60 days, starting one week following exposure to the disease. While the treated cattle showed no clinical evidence of anaplasmosis, nor were they carriers of the disease following treatment, there was a transitory antibody response to the Anaplasma organism in 1 animal.

Although the cattle in lots 1 and 2 were not exposed to anaplasmosis during or following the period of chlortetracycline feeding, it is probable that protection against the infection does not extend beyond the time that the antibiotic is fed. This is indicated by the fact that no antibody titer to the complement-fixation test was noticed in the antibiotic-fed cattle after the thirty-fourth day of the experiment.

The feeding of 0.5 mg. of chlortetracycline to protect cattle against infection with anaplasmosis should be useful in areas where a relatively short term protection is needed. In the sections of the United States where tabanid flies are the principal vectors of anaplasmosis, cattle could be given chlortetracycline in the feed during the season when the flies are prevalent. Loss from anaplasmosis in feedlots where the disease has been a problem could be prevented by this method of protection.

SUMMARY

Fifteen yearling steers were given 5.0 ml. of anaplasmosis-carrier blood. Five of the 15 were given 1.0 mg. of chlortetracycline (as aureofac-10®) per pound of body weight daily in feed for 60 days, 5 were given 0.5 mg. of chlortetracycline in the same manner, and 5 were given no chlortetracycline.

The 10 steers that were exposed and given the drug showed no evidence of anaplasmosis infection, except a transitory titer to the complement-fixation test. These steers were not carriers of anaplasmosis after this treatment. The 5 steers that were exposed but did not receive chlortetracycline became infected with anaplasmosis.

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Copper Oxychloride Poisoning in Cattle.—Two 1,100-lb. steers drank a small quantity of a suspension of copper oxychloride, each ingesting an estimated 2.5 oz. of the drug. Approximately 48 and 70 hours later, respectively, each suddenly developed signs of intoxication, showing a greenish blue, watery diarrhea; depression; dyspnea; and a weak, rapid pulse. In spite of calcium versenate therapy, both died in another 24 to 36 hours. Necropsy indicated that death was due to an acute enteritis and that the copper was not absorbed.—*Marshall and Todd in Vet. Rec. (Jan. 26, 1957): 77.*

Survey of Anaplasmosis Reactors in Kansas
A Preliminary Report

EARL J. SPLITTER, D.V.M., M.S.; HARRY D. ANTHONY, D.V.M.; MARVIN J. TWIEHAUS, D.V.M., M.S.

Manhattan, Kansas

THE PRINCIPAL reservoir of bovine anaplasmosis in the United States has long been recognized as the bovine carrier. Development of an accurate serological test for identification of these carriers has raised the hope of eventual elimination of the disease through eradication or isolation of the disease source.

A general survey of the incidence and distribution of anaplasmosis carriers in Kansas cattle is being made in cooperation with the Agricultural Research Service of the United States Department of Agriculture. Anaplasmosis has been known to be present in Kansas for more than 30 years, with the first positive diagnosis of the disease in the United States being reported from this state.[1]

This paper reports the preliminary survey results of the anaplasmosis complement-fixation (CF) test on blood serum of cattle selected at random from all parts of the state.

PROCEDURE

Cattle blood serums were received from the Kansas brucellosis laboratory after they had been tested for brucellosis. Samples were phenolized to contain a 0.5 per cent final concentration and were stored at 3 C. until tested.

Antigen and serums for standardization of the test were supplied by the Agricultural Research Service. The CF test procedures and interpretation employed were those supplied by Mott[2] and were similar to the method used by Gates *et al.*[3] Positive and suspicious samples obtained in the survey were forwarded to Beltsville, Md., for check testing by the Agricultural Research Service.

The survey included 5,000 samples, representing 160 beef and dairy herds in Kansas. The number of cattle in each herd averaged 31 and varied from 15 to 230.

RESULTS AND DISCUSSION

A total of 44 reactors and 12 suspects were found in the survey, or 1.1 per cent of the 5,000 animals tested. Of the 24 herds which had reactors or suspects, approximately one half had only one reactor or suspect (table 1). The greatest herd infection observed was one with 55 per cent of 20 animals reactors or suspects. In these 24 apparently infected herds, 6.0 per cent of the total number of cattle were reactors and 1.7 per cent were suspects.

TABLE 1—Herd Incidence of Anaplasmosis Reactors and Suspects in a Survey of 5,000 Cattle in 160 Herds in Kansas

No. of reacting herds	Reactors	Suspects
9	1	0
3	0	1
5	2	0
1	2	1
2	3	0
1	3	2
1	6	0
1	7	4
1	1	2
24	44	12

This survey showed close agreement between the location of herds with anaplasmosis reactors and the area of the state in which acute anaplasmosis has occurred consistently. The 52 reactors and suspects were from herds in the eastern third of the state, an area in which the disease has been enzootic. In this portion of the state, carrier incidence is 1.8 per cent.

An opportunity was afforded to observe the specificity of the anaplasmosis test in brucellosis-positive animals. Of 340 blood samples classified as Brucella reactors or suspects, seven (2%) were positive or suspicious to the anaplasmosis test. This percentage is very close to the over-all anaplasmosis incidence (1.1%) and indicates

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The authors thank Dr. L. O. Mott, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Md., for supplying antigen, test protocol, standardizing serums, and advice and information essential for conducting the tests; and Dr. Louis Smith, Agricultural Research Service, inspector-in-charge, Topeka, Kan., for supplying cattle serums used in this survey.

that anaplasmosis reactions occurred independently of Brucella reactions. This agrees with observations made previously.[3]

If additional surveys in the state confirm the low incidence of anaplasmosis carriers, the outlook will appear promising for eventual control of the disease in Kansas. Results have been favorable when the anaplasmosis CF test has been used to eradicate the disease from herds with a small number of carriers.[2] It is possible that the carrier incidence may be at a relatively low ebb in Kansas because of the prolonged drought occurring in the state. A marked reduction in Tabanidae, which are believed to be the principal vectors here, has been noted in the anaplasmosis areas.

SUMMARY

1) In an anaplasmosis complement-fixation test survey of 5,000 cattle from all sections of the state of Kansas, 1.1 per cent were reactors or suspects.

2) The majority of reactors and suspects occurred in the area of the state in which the disease is enzootic.

3) There appeared to be no significant cross reaction between brucellosis and anaplasmosis reactors.

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Manifestations of Anaplasmosis.—The first sign of anaplasmosis is loss of appetite and, since by this time the febrile period has usually passed, it is important not to confuse this anorexia with some afebrile condition. A microscopic examination of blood smears will eliminate such an error, and a hematocrit reading will show a destruction of red cells. For a positive diagnosis, Anaplasma bodies must be demonstrated. Necropsy findings are: an enlarged spleen with a reddish brown pulp; enlarged gallbladder filled with dark grumose bile; enlarged liver with rounded edges, yellowish if icterus has developed; degeneration of heart muscle, often with epicardial petechiation; and moderate gastrointestinal catarrh.—*H. Schmidt in Ann. New York Acad. Sci., 64 (1956): 2.*

Anaplasma-like Bodies in the Guinea Fowl

DEOGRACIAS J. CABRERA, D.V.M., LL.B.

Manila, Philippines

On Aug. 4, 1942, several blood smears from guinea fowls were received from the Institute of Hygiene, University of the Philippines,* by the Parasitology and Protozoology Division (now Parasitic Diseases Division), Bureau of Animal Industry. They were given to the author for study and diagnosis.

From the meager information obtained, it was learned that several birds of the flock had died after showing signs of loss of appetite, greenish diarrhea, ruffling of the feathers, droopiness of the wings, and decreased activity.

It was later learned that the flock was wiped out by the undetermined disease.

DESCRIPTION OF THE ANAPLASMA-LIKE BODIES

Examination of the smears, stained with Giemsa, showed red, granular, punctiform, rounded, irregularly-shaped, or oval bodies with a mean diameter of 0.86 $\pm$ 0.28 μ, s.d. 0.41 (range 0.13 to 2.18 μ) in the red blood cells, closely and tangentially applied to the circumference of the nucleus of the red blood corpuscles (fig. 1). The granules appeared to be entirely of chromatin and, judging from those which showed signs of division, multiplication was probably by binary fission.

From one to six or more such bodies were seen in each red blood cell with the one granule per cell constituting 60 per cent of the affected erythrocytes; two per cell, 18 per cent; three per cell, 10 per cent; four per cell, 8 per cent; five per cell, 2 per cent; and six or more per cell, the remaining 2 per cent.

DISCUSSION

Red-staining granules of various shapes and sizes in the red blood cells of the vertebrates have been described by many investigators. The Anaplasma, Eperythrozoon, Bartonella, and other related structures are too well-known to merit further description here.

From the Parasitic Diseases Division, Bureau of Animal Industry, Manila, Philippines.

*The blood smears belonged to the late Dr. Candido M. Africa, then head, Department of Parasitology.

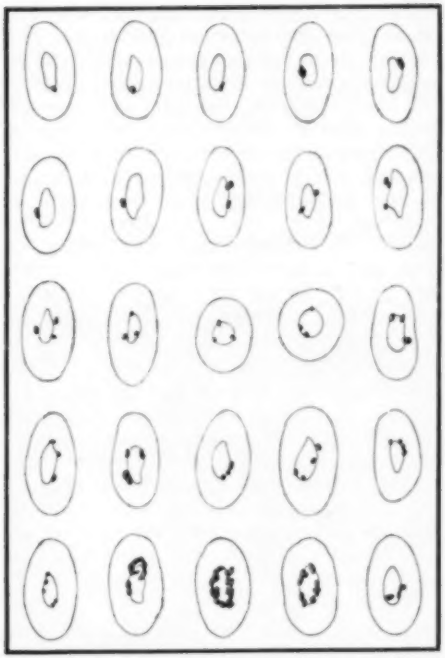

Fig. 1—A diagrammatic drawing of the red blood cells of the guinea fowl, showing the granules attached to the nucleus of the red blood cells.

Red-staining granules in the red blood cells of birds have also been reported by various authors[1,2,5-9] but all of the granules so far reported were observed to lie in the cytoplasm of the red blood cell and, in later studies, were shown to resemble structurally the piroplasms, for which the name *Aegyptianella pullorum* was proposed.[3]

In the red blood cells of a Brazilian tortoise, *Chelonia midas*, similar bodies named *Tunetella cheloniae* were reported.[4]

The present material was observed to be composed entirely of chromatin and as such resembled the Anaplasmidae rather than the Babesiidae to which the Aegyptianella belongs. The granules in the present material also differed from those previously reported in that while the latter were in the cytoplasmic portion of the cell, these were invariably attached to the nucleus of the red cell.

PROPOSED CLASSIFICATION

Because of the close resemblance of the granules in this material to the Anaplasma-Bartonella-Grahamella-Eperythrozoon group of organisms, the author considers these granules to represent an organism which he proposed to place under the family Anaplasmidae.[10] Since these bodies, in contrast to all others previously described, were constantly observed to be attached o the periphery of the nucleus of the red blood cell, the name *Karyonella cristata*, gen. and sp. nov. is proposed.

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Myxomatous Polyps of Rumen and Reticulum.—Nine months before slaughter, a steer apparently recovered completely when treated for recurrent tympany. Upon slaughter, a pedunculated mass of grapelike tumors, 14 by 11 inches and weighing 17 lb., was found attached near the esophageal groove. It consisted of soft, translucent, colorless, gelantinous material. Other small polyps were also present.

The recurrent tympany may have been caused by the lesion, and interference with eructation may have stopped as its weight pulled the growing tumor downward.—*Johnston and Donald in Vet. Rec. (Feb. 9, 1957): 112.*

Osteogenesis Imperfecta in a Kitten

A female Siamese kitten, 6 months old, had periodic incoordination, posterior weakness, and lameness. When first examined, it was unable to walk and was hypersensitive when handled. It was small for its age, but well nourished.

A radiograph (fig. 1) shows extreme thinness of the compact portion of the long bones, due to lack of normal osteogenesis, and also a fracture of the left femur. Osteogenesis imperfecta is generally considered to be of hereditary origin. Response to treatment is doubtful and euthanasia is usually advised.—*J. W. Skaggs, D.V.M., and J. A. Theobald, D.V.M., Cincinnati, Ohio.*

Fig. 1—A radiograph of the pelvis and hindlegs of a kitten showing the thin compact bone and the fracture of the left femur.

Piperazine Anthelmintics for Sheep.—Both the piperazine salts and the complex piperazine-l-carbodithioic betaine were found, in Australia, highly effective against Oesophagostomum species, but less effective on other nematodes of the large intestine in sheep. When injected directly into the abomasum, the salts were not effective against *Haemonchus contortus* or *Trichostrongylus colubriformis*, while the complex, which yields carbon bisulfide in an acid medium, was effective against *H. contortus* but not generally effective against *T. colubriformis*. The action of both on *Oesophagostomum columbianum* was rapid; 99 per cent of the parasites were passed within 24 hours.—*H. M. Gordon in Austral. Vet. J. (Jan., 1957): 1.*

Parenteral Iron Therapy for Pig Anemia.—A single intramuscular injection of 100 mg. of iron, using an iron-dextran compound, was effective in Denmark in reducing anemia in 45 pigs about 10 days old. It was more effective than providing turf sprinkled with an iron and copper sulfate mixture. The latter is the most economical prophylactic measure.—*Vet. Bull. (March, 1957): 135.*

Enterotoxemia (Edema Disease) in Pigs.—Hemolytic *Escherichia coli* of specific serotypes have been found associated with "edema disease" of pigs in Britain. These serotypes seem to be noninvasive and are not commonly found in pigs, except when associated with this disease. A condition indistinguishable from this disease was produced in 13 pigs by the intravenous injection of an extract of a serotype of this organism isolated from a field case. Similar injections of extracts of hemolytic *Esch. coli*, isolated from unaffected pigs, did not produce the condition.—*Sojka, Erskine, and Lloyd in Vet. Rec. (March 2, 1957): 293.*

Response to Lymphomatosis Vaccine.—When chickens less than 1 year old were given several injections of virulent virus of visceral lymphomatosis, or only two injections of the adjuvant vaccine, their progeny were much more resistant to the virus than progeny of either the same hens before immunization or of untreated hens. When killed with formalin, the virus provoked some immunity but less than the live virus preparations. Thus, immunity can be passed through the egg.—*Poult. Sci. (Jan., 1957): 79.*

What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue of the JOURNAL.

Make your diagnosis from the picture below — then turn the page ▶

Figure 1

History.—A female Siamese cat, 11 months old, had shown increasing emaciation, anorexia, and severe dyspnea, with abdominal breathing, for several weeks. A lateral radiograph was taken.

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

This case was submitted by Dr. L. M. Bodie, Moses Lake, Wash.

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Possible thymoma or a malignant lymphoma (lymphosarcoma) in a cat.

Discussion.—The ground glass appearance in all parts of the thoracic area, except the posterodorsal lung fields (A), indicates the presence of considerable tissue or fluid. The possible causes for the pathological changes are: empyema; a tumor; or a chronic granulomatous disease (fungal infection or tuberculosis). Euthanasia was performed.

COMMENTS

A mass was found filling the anterior portion of the pleural cavity. It seemed to be attached only to the pleura at the apex of the thorax. The anterior lobes of the lungs were compressed and, with the heart, were forced posteriorly. Some fluid was present in the pleural cavity and an ulcer was found in the gastric mucosa.

Microscopically (fig. 3), this tumor is composed of lymphocytic-type cells, loosely arranged in small groups in a reticular-type stroma. The cells are round and oval with a dark nuclear wall. They contain scattered chromatin granules and an occasional agglomeration of blue-staining material, probably an enlarged nucleus. In addition to the lymphocytic-type cells, a few epithelial-type cells were found containing a large amount of pinkish cytoplasm which surrounded a slightly eccentric nucleus. Numerous mitotic figures were observed. No definite medullary tissue was observed, although a few structures resembling Hassell's corpuscles were seen at the margin of the section. This tumor may be a thymoma or a malignant lymphoma (lymphosarcoma). The occurrence of the tumor in the anterior mediastinum or posterior neck region suggests that it is a thymoma. However, malignant lymphoma is common in middle-aged cats, but it is usually located in the viscera. Because of the location and the structure of the tumor, as well as the age of the cat, it was called a malignant thymoma. A number of malignant thymomas have been seen in cattle and sheep by us and by others[1] but this is the first one we have seen in a cat.—*G. R. Spencer, Chairman, Department of Pathology, College of Veterinary Medicine, Washington State College, Pullman.*

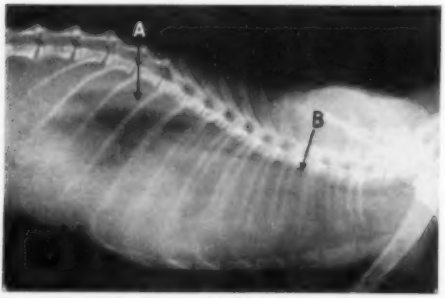

Fig. 2—Lateral radiograph of a cat showing increased density in the lung area. Notice the functional portion of the diaphragmatic lobes of the lungs (A) and the shadows of the trachea and bronchi (B).

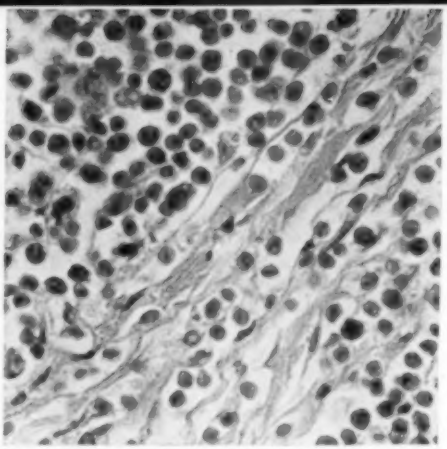

Fig. 3—Photomicrograph of a section of the tumor showing the mononuclear tumor cells. x 300.

• • •

The ground glass appearance of three-fourths of the chest might indicate tumor, fluid (empyema, serum, or chyle), or a combination of the two. A chronic granulomatous disease is also a possibility. The chest might be tapped and drained of fluid and subsequently radiographed for further differential diagnosis. If fluid, rather than tumor, is the principal cause of the ground glass appearance, then this can be confirmed simply by placing the animal on its back. The air space then appears in the ventral portion of the chest. The film, I presume, shows the cat on its side.

Holzworth[2] reported ten tumors of the precardiac mediastinum, saying "These constitute a group representing what is commonly called "lymphosarcoma of the thymus. Since, however, there was minimal histological evidence of such origin, the topographical term . . . is considered preferable."—*Publications Committee, American Veterinary Radiological Society.*

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Cardiac and Aortic Arch Anomalies, Hydrocephalus, and Other Abnormalities in Newborn Pigs

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C. C. TURBES, D.V.M., M.S.

St. Paul, Minnesota

CONGENITAL malformations in swine have been so infrequently reported in veterinary literature that it is impossible to estimate their significance to the livestock industry. The authors, preliminary to studies involving the experimental production of congenital abnormalities in swine,[1,2] conducted a survey to determine the presence of these abnormalities in the newborn from one herd of swine. The survey included only the pigs that were stillborn or that died shortly after birth. The purpose of this article is to describe the abnormalities observed and to discuss their embryological development.

MATERIALS AND METHODS

The survey encompasses pigs born during one farrowing period of a herd in which 51 sows gave birth to 413 pigs. Of these, 8 were stillborn and 67 died or were killed during the first two weeks following birth. Of the above, 48 were examined as a part of this study.

The necropsy procedure was standardized as follows. The hair, appendages, and body orifices were examined. The pleural and peritoneal cavities were opened and the abdominal organs were inspected. The lungs were observed closely for fetal atelectasis. The heart, with its associated vessels and nerves, was not disturbed at this time. The dorsal aspect of the skull was exposed and the cranial sutures were examined for evidence of hydrocephalus. The brain was removed and immersed in 10 per cent formalin. The opened carcasses were also placed in formalin for varying periods of fixation, and then were removed for further study. The cardiac and precardiac areas were dissected carefully so as to present the major vessels arising from the arch of the aorta and the nerves associated with them. The heart was opened and examined for interatrial and interventricular septal defects. The brain was observed grossly for defects and sectioned serially.

From the Division of Veterinary Anatomy (Kitchell) and the Division of Veterinary Physiology and Pharmacology (Stevens), School of Veterinary Medicine, University of Minnesota, St. Paul. Dr. Turbes is with the Department of Anatomy, Indiana Medical School, Bloomington, Ind.

Approved for publication as scientific journal series paper No. 3693, Minnesota Agricultural Experiment Station, St. Paul.

OBSERVATIONS

Ten congenital abnormalities of five different types were found in 7 of the pigs.

Type 1—Cardiac Interventricular Septal Defect.—This defect was found in 1

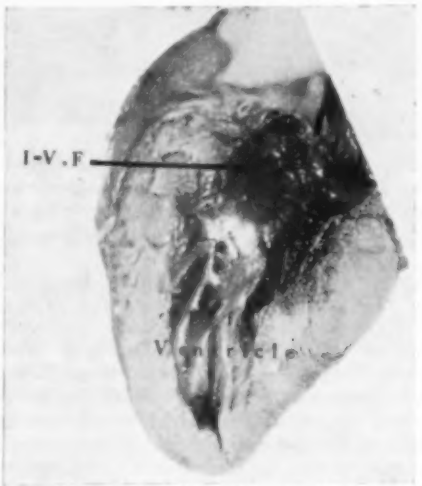


Fig. 1—Photograph of heart from pig showing interventricular septal defect (I-V.F).

Chester White pig which was dead when first examined. The presence of food in the digestive tract, healing of the umbilicus, and the absence of fetal atelectasis in the lungs indicated the pig had not been stillborn. An interventricular foramen was found at the musculomembranous junction of the interventricular septum (fig. 1). The foramen ovale and ductus arteriosus were patent but neither was significantly larger than usual at birth. No other defects were found.

Type 2—Anomalous Right Subclavian (Brachial) Artery Arising from the Pulmonary Trunk.—This abnormality was observed in a male Chester White pig. The fetal membranes on the body and in the mouth and the presence of fetal atelectasis of the lungs suggested that the pig had

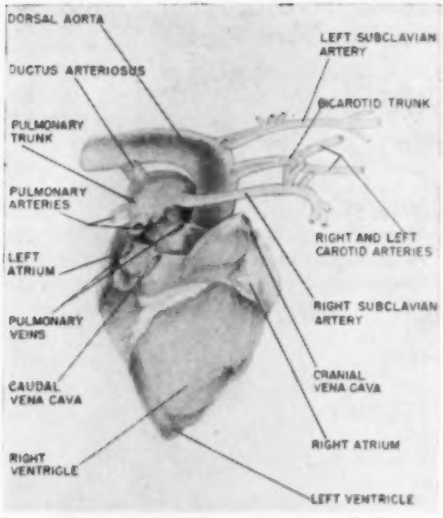


Fig. 2—Drawing illustrating appearance of the anomalous right subclavian artery arising from the pulmonary trunk in the pig (right view).

died before inhalation of air. Dissection of the arteries arising from the arch of the aorta showed that the right subclavian artery arose from the pulmonary trunk directly opposite the ductus arteriosus (fig. 2; compare with fig. 5 which illustrates the usual origin of the right subclavian artery). The anomalous artery was located dorsal to the ascending aorta and ventral to the esophagus and trachea. This artery extended cranially by running to the right

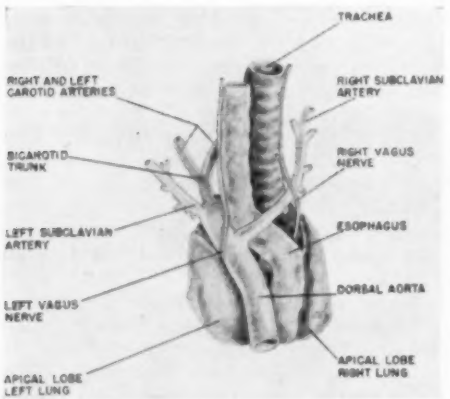


Fig. 3—Drawing illustrating appearance of the pig's anomalous right subclavian artery arising distally from the dorsal aorta and passing dorsal to the esophagus (dorsal view).

of the arch of the aorta. No significant variations were found in its peripheral branches. The right recurrent laryngeal branch of the vagus nerve turned ventrally and cranially around the anomalous artery. The left recurrent laryngeal nerve was in its normal relationship, turning ventrally and cranially around the ductus arteriosus. The left subclavian artery and the bicarotid trunk arose separately from the arch of the aorta. The ductus arteriosus was patent. No variation in the degree of development of the right and left pectoral limbs could be observed.

Type 3—Anomalous Right Subclavian Artery Arising Distally from the Dorsal Aorta and Passing Dorsally to the Esophagus.—This type of abnormality was found in 2 male (S4 and S7) and 1 female (S6) Chester White pigs. Pig S4 was alive but was weak and unable to stand. It was exsanguinated for necropsy. The bones of the calvaria were soft and the suture lines easily ascertained, thus indicating the presence of hydrocephalus (fig. 4). The adrenal glands were located more cranially than usual and the right adrenal was grossly misshapen. The right subclavian artery arose from the dorsal aorta caudal to the origin of the left subclavian artery and the ductus arteriosus (fig. 3). The anomalous artery crossed to the right side of the thorax by passing dorsally to the esophagus and trachea, compressing the esophagus. No impaction or dilatation of the esophagus cranial to this compression could be observed. The right recurrent laryngeal nerve did not pass around any structure but arose from the vagosympathetic trunk at the junction of the cranial and middle third of the neck and went directly to the larynx. The left recurrent laryngeal nerve was in its normal location.

Pigs S6 and S7 were dead but had evidently lived for a short period. Severe hydrocephalus was present in each (fig. 4). The relations of the anomalous right subclavian artery and the right recurrent laryngeal nerve in each of these pigs were essentially the same as those described for S4.

Type 4—Congenital Internal Hydrocephalus.—Three of the pigs (S4, S6, and S7) having this defect also had a type 3 abnormality. The fourth pig was a Chester White female (S42) which had lived for a short period.

In pigs S4 and S6, the hydrocephalus

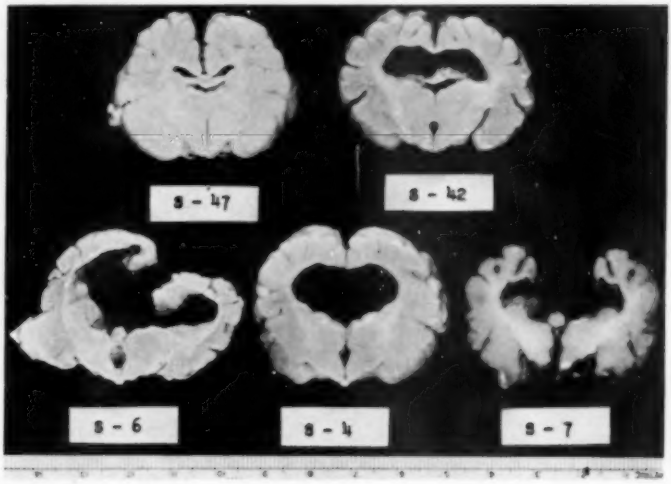


Fig. 4—Photograph illustrating appearance of internal hydrocephalus, in 5 pigs, in cross sections. Compare with normal (S-47).

was conspicuous because of the doming of the skull in S6 and the widening of the sutures in S4. In pigs S7 and S42, the hydrocephalus was discovered after the calvaria had been removed. The most pronounced lesions in each animal were distention of the lateral ventricles and cerebral aqueduct with compression of the cerebral cortex, basal ganglia, and thalamus (fig. 4). No occlusion of the ventricular duct system could be found by gross examination of the serially sectioned brains.

Type 5—Malformed Pelvic Limbs.—One pig (S46), a Duroc Jersey female, had malformed pelvic limbs. The malformation involved both extremities distal to the tarsus with a plantar contraction of those portions of the limbs. No other defects were found in this pig.

DISCUSSION

The development of the aortic arch anomalies (types 2 and 3) has been frequently related to an interference with the transformation of the aortic arch system of the embryo into the definitive pattern of the major arteries of the thorax and neck. It is generally accepted that six pairs of aortic arches comprise the aortic arch system[4] but, in most mammals including the pig, the fifth pair remains rudimentary or unrecognizable (fig. 5). All the aortic arches do not appear simultaneously in the embryo but appear in temporal succession. Before the last pair appears, the first two pairs have undergone regression. Parts of the third, fourth, and sixth pairs are retained and used in the formation of the major arteries. The transformation of the aortic arch system in the pig embryo is schematically presented (fig. 5, 6). Important developmental features are the method of formation of the brachiocephalic artery and its relations to the right subclavian artery and the bicarotid trunk, the relations of the left recurrent laryngeal nerve to the ductus arteriosus (sixth aortic arch), and of the right recurrent laryngeal

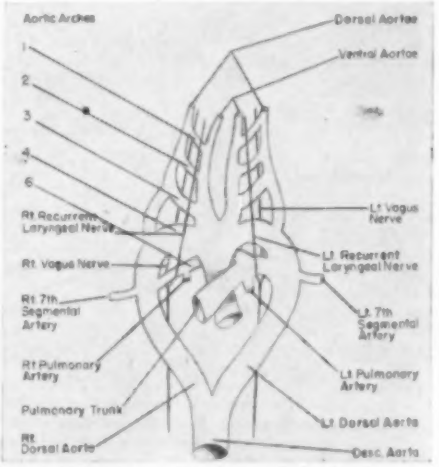


Fig. 5—Schematic representation of the developmental pattern of aortic arches in the pig embryo.

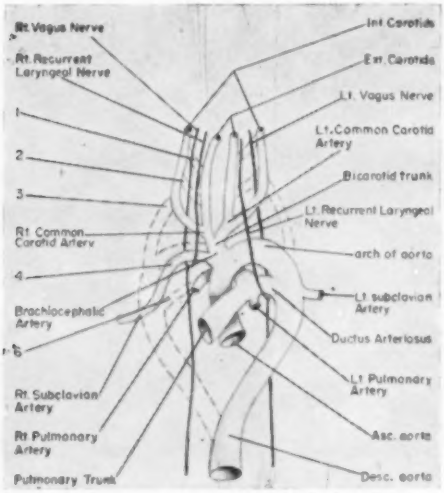


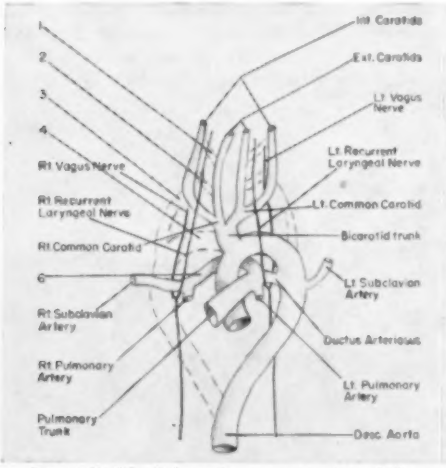
Fig. 6—Schematic representation of the definitive pattern of arteries derived from the aortic arch system of the pig embryo. Parts of the embryonic system that undergo complete regression are indicated by broken lines.

nerve to the right subclavian artery (fourth aortic arch).

The hypothetical pattern of development of the type 2 abnormality (anomalous right subclavian artery arising from the pulmonary trunk) is shown (fig. 7) and was supported by the location of the right recurrent laryngeal nerve which turned cranially around the anomalous artery. This indicated that the right sixth aortic arch did not undergo regression. This type of anomaly seems to occur rarely and most of those reported have been in the pig. One was in a 21-cm. pig[3] and another, possibly three, in 25- to 40-mm. fetal pigs.[4] Such an anomaly was also found in the offspring of vitamin A-deficient rats.[5] The presence of this anomaly in a living animal would result in the right pectoral limb being supplied with blood having high CO_2 and low O_2.

The hypothetical pattern of development of the type 3 abnormality (an anomalous right subclavian artery arising distally and passing dorsal to the esophagus) is illustrated (fig. 8) and supported by the failure of the right recurrent laryngeal nerve to turn cranially around the anomalous right subclavian artery. This indicated that the right fourth aortic arch had undergone regression and, thus, did not confine the recurrent laryngeal nerve near the thoracic inlet but permitted it to lie free in the midcervical region.

Few reports could be found which describe this condition in domestic animals. We have observed this anomaly in 5 of a



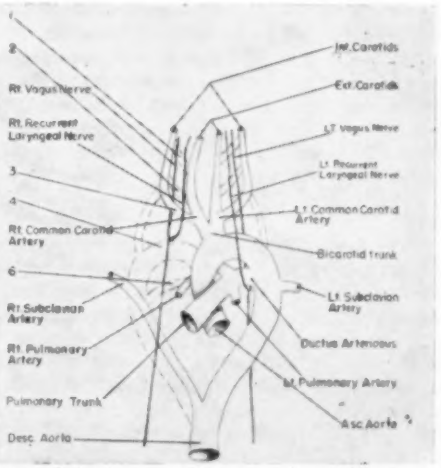


Fig. 7 (Left)—Schematic representation of the pattern of development of the anomalous right subclavian artery arising from the pulmonary trunk in a pig (fig. 2). Note that the right recurrent laryngeal nerve turns cranially around the right sixth aortic arch (right subclavian artery).

Fig. 8 (Right)—Schematic representation of the pattern of development of the anomalous right subclavian artery, in a pig, arising distally and passing dorsal to the esophagus (fig. 3). Note that the right recurrent laryngeal nerve does not turn cranially around any arterial structure.

series of 150 dogs dissected in our gross anatomy laboratory.[6] The developmental features of this anomaly in the dog are mentioned[7] but no cases were reported. This condition has been reported in several hundred cases in man and was the most commonly occurring anomaly observed in studies[8] of rat fetuses from mothers fed vitamin A-deficient diets. It also has been reported[9] as a morphogenetic variation in rabbits.

Interventricular septal defects (type 1 anomaly) have been associated historically with deficient growth or improper union of the three masses of endocardial tissue that assist in the formation of the membranous part of the interventricular septum. Similar cases in the pig have been reported.[10,11] From 50,000 pig embryos examined, 100 definitely abnormal embryonic hearts were recovered,[12] mostly in the 18- to 50-mm. stages. Most of these were the result of abnormal development of the truncus arteriosus.

Congenital hydrocephalus has been reported in domestic animals by a number of workers.[13-16] Some[13,14] believe that the condition is probably hereditary; others[15] suggest that nutrition may be a contributing factor.

Congenital malformations similiar to the type 5 abnormality have been described[17] and congenital malformations, such as syndactylism, talipes, and paralysis agitans, were believed to be related to deficient nutrition.

The observations presented in this study do not suggest which of many possible causative factors were responsible for the production of the abnormalities described. The causes of congenital defects have been the subject of a number of excellent papers and reviews, two[18,19] being comprehensive.

The relatively high percentage (14%) of anatomical anomalies in this group of pigs which were born dead or died the first week of life is noteworthy. Whether or not these anomalies are as common as this study would suggest and what their contribution is to the mortality rate at that stage of development is also of interest.

SUMMARY

Five types of major abnormalities were observed in 7 of 48 pigs examined from a nonexperimental series. The abnormalities found were one of a cardiac interventricular septal defect, one of an anomalous right subclavian artery which was a branch of the pulmonary trunk, three in which an anomalous right subclavian artery arose distally from the aorta and passed dorsal to the esophagus, four of internal hydrocephalus, and one of malformed pelvic limbs.

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Q Fever Studies in Ohio

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Q FEVER IS A rickettsial disease of man for which a variety of animal hosts have been shown to serve as reservoirs of infection. Although the exact mode of transmission from animal to man remains unknown, an association has been demonstrated between the infection in animals and its incidence in man. It is also known that Q fever has been present in endemic areas for some time prior to its recognition. As a part of the epidemiological studies of this disease in southern California, serological surveys revealed a high incidence of infection in cattle.

Since Q fever produces an asymptomatic infection in animals, its recognition in them is usually delayed until after many human beings have been infected. If the infection in man is to be controlled through elimination or control of the animal reservoir, early diagnosis in animals is important.

Work on the control of Q fever is being carried on by the U. S. Public Health Service. Regardless of the control measures which may evolve, certain basic information pertaining to the incidence of the disease is required before a control program can be initiated.

An epidemiological study was made of cattle in Ohio in an attempt to rule out or establish the incidence of Q fever in this species as well as in man. Prior to this study, it had not been reported in this state.

Cooperating in this project were the Ohio Division of Animal Industry, Ohio Department of Health, City of Columbus Department of Health, and the Department of Veterinary Preventive Medicine of the Ohio State University.

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MATERIALS AND METHODS

Method of Study.—This epidemiological study of Q fever in Ohio included (1) five serological surveys of cattle (designated as pilot survey, follow-up survey, contact survey, 15-county survey, and milk survey); (2) a serological study of its spread in an Ohio dairy herd; (3) studies of Q fever-infected cattle by means of laboratory animal-inoculation tests; and (4) surveys of persons in contact with serologically positive cattle, veterinarians, packinghouse workers, and diagnostic serums received by the Ohio Department of Health laboratory.

The bovine serum samples for the pilot, follow-up, and 15-county surveys were obtained from the Ohio Brucellosis Testing Program, either direct from the mobile laboratories in the field or from the central laboratory. The serum samples for the contact survey were obtained directly from the herds in question for the express purpose of the survey.

The specimens for the milk survey were taken from samples obtained by the City of Columbus Department of Health as a part of their quality control program.

Both bovine serum and milk samples were tested for the presence of Q fever antibodies by the capillary-agglutination method developed by Luoto.[1] The standard complement-fixation test employing the Nine Mile* strain of *Coxiella burnetii* as antigen was used for the testing of human and laboratory animal serums. In order to maintain consistency, all titers reported herein were determined by the complement-fixation test.

In attempts to isolate *C. burnetii* from milk and placental tissues from serologically positive animals, we employed essentially the methods described, in 1948, by Huebner *et al.*[2] and subsequently used successfully by many workers throughout the world. Five cubic centimeters of raw milk from individual cows or from pooled milk samples were inoculated intraperitoneally into groups of 3 to 5 guinea pigs. The test animals were observed and temperatures were taken daily for five weeks. Pre- and postinoculation blood samples were tested for the presence of complement-fixing antibodies. In some experiments, 1 or 2 of the guinea pigs were killed between the eighth and fourteenth postinoculation days, and spleen passages were made to other guinea pigs, mice, hen egg yolk sac, and Hela cell tissue culture.

RESULTS

Results of Serological Surveys.—Pilot Survey.—In 1954, a total of 4,562 cattle

*Produced by Lederle Laboratories, Pearl River, N.Y.

from 256 herds, located in 69 of Ohio's 88 counties, were tested. Not more than 0.5 per cent of any county's total cattle population was tested. A total of 3 dairy cows from three herds had positive reactions, 2 with titers of 1:16 and 1 with 1:256 (table 1). Laboratory animal inoculation tests demonstrated that the cow with the titer of 1:256 was shedding *C. burnetii* in the milk.

Follow-Up Survey.—In a follow-up survey, conducted in the county in which this known-infected cow was located, 1,375 cattle from 84 herds were tested with negative results (table 1).

Contact Survey.—In 1954, 9 cows and 3 bulls from the purebred dairy herd, containing the infected cow, were shown at several exhibitions throughout Ohio. They were tested and found to be serologically negative for Q fever prior to these shows. Upon their return to the herd, 4 cows were serologically positive at titers of 1:32 or greater, and 2 bulls at 1:8. Twenty-three herds of the same breed, known to have had contact with this herd at one or more of these shows, were serologically surveyed for evidence of infection. Of the 1,043 head representing the entire population of these herds, 12 cows from three herds were positive at titers of 1:8 or greater (table 1).

Fifteen-County Survey.—This was a sample survey of the dairy cattle in 15 representative Ohio counties, including those in border areas where most of the interstate traffic of cattle occurs. They also represent the different geographic and climatic areas of the state, as well as the various economic standards and types of animal husbandry (fig. 1). A total of 8,736 cattle from 748 herds were tested—4.5 per cent of the cattle from 3.6 per cent of the herds. A total of 59 cows in 16 dairy herds reacted, with titers ranging from 1:8 to 1:128 (tables 1, 2).

Fig. 1—Fifteen-county serological survey of bovine Q fever in Ohio.

Milk Survey.—Composite raw milk samples from 2,047 dairy herds, located in 17 central Ohio counties, were tested. This represented 100 per cent of the producers shipping milk into the Columbus milkshed. Nine samples were positive (table 1).

The Spread of Q Fever in a Dairy Herd.—A purebred dairy herd (which had 1 cow with a titer of 1:256) was included in the pilot survey. During a 14-month period, this herd was serologically tested six times.

With the exception of the 1 positive cow, all animals in the herd were serologically negative when retested 30 days after the

TABLE 1—Bovine Q Fever Studies in Ohio—Results of Serological Surveys of Ohio Cattle

Survey	No. of cattle tested	No. of herds tested	No. of positive reactions with complement-fixation titers of 1:8	1:16	1:32	1:64	1:128	1:256	Total positive reactions 1:8 or greater	Herds with 1 or more positive reactors	Percentage of total with titer of 1:8 or greater	Percentage of herds with 1 or more positive reactors
Pilot survey	4,562	256	—	2	—	—	—	1	3	3	0.06	0.1
Follow-up survey	1,375	84	—	—	—	—	—	—	0	0	0	0
Contact survey	1,043	23	6	4	—	—	1	1	12	3	1.1	13.0
Fifteen-county survey	8,736	748	18	26	9	2	4	—	59	16	0.67	2.1
Milk survey	Composite samples	2,047	—	—	—	—	—	—	—	9	—	0.4

TABLE 2—Bovine Q Fever Studies in Ohio—Results of 15-County Serological Survey

County	Estimated No. dairy cows and heifers 2 yr. and over*	No. of dairy herds*	No. dairy cattle tested	No. dairy herds tested	Percentage of dairy cattle tested	Percentage of dairy herds tested	No. of positive reactors with titer of 1:8 or greater
Ashtabula	23,800	2,091	1,249	69	5.2	3.3	24
Carrol	10,800	1,180	568	47	5.2	3.9	1
Clermont	12,400	1,343	662	69	5.3	5.1	2
Clinton	8,000	1,101	227	13	2.8	1.1	0
Darke	26,200	2,534	946	85	3.6	3.3	1
Defiance	9,700	1,092	238	27	2.5	2.5	0
Gallia	11,900	1,612	600	54	5.0	3.3	0
Geauga	14,300	993	736	59	5.1	5.9	1
Jefferson	7,100	804	259	18	3.6	2.2	0
Lawrence	4,900	1,200	282	19	5.7	1.5	0
Meigs	9,500	1,283	493	55	5.1	4.2	0
Richland	14,400	1,424	490	48	3.4	3.3	25
Shelby	15,900	1,314	964	81	6.0	6.1	2
Williams	13,800	1,310	689	69	5.0	5.2	3
Wyandot	8,800	985	333	35	3.7	3.5	0
Total	191,500	20,266	8,736	748	4.5	3.6	59

*Ohio Cooperative Crop Reporting Service.

initial test. However, a third test of the herd, ten weeks following the second test, revealed 7 additional serologically positive animals. Three subsequent tests revealed further spread of infection within the herd (table 3).

Results of Laboratory Animal Inoculation Tests.—A postinoculation serological titer of 1:32 or greater occurred in guinea pigs inoculated with milk from 9 cows from three herds. They showed no consistent temperature elevation or other signs of illness. In two of four attempts at serial spleen passage, no serological response was obtained in the guinea pigs. In one instance, serological responses were obtained in the guinea pigs through three successive spleen passages but none on the fourth passage. In the last attempt, serological responses were obtained through five successive spleen passages and febrile responses began with the second passage.

The U. S. Public Health Service has recently reported[3] the isolation of *C. burnetii* from a milk sample shipped in the frozen state. Rickettsia were demonstrated in egg yolk material after guinea pig spleen passage and was confirmed by cross-protection tests with a California strain of *C. burnetii*.

Results of Serological Surveys in Man.—Attempts to determine the presence of Q fever in man in Ohio were restricted to four activities.

1) Of 29 persons in contact with sero-

TABLE 3—Serological Study of the Spread of Q Fever in an Ohio Dairy Herd

Date tested	July 15, 1954	Aug. 15, 1954	Dec. 2, 1954	Dec. 30, 1954	Mar. 18, 1955	Sept. 22, 1955
No. tested	39	63	64	35	73	64
No. of reactors	1	1	8	13	14	9
Reactors with titers	F-1 1:256	F-1 1:256	F-1 1:128 F-2 1:32 F-3 1:64 F-4 1:32 F-5 1:32 M-1 1:8 M-2 1:8 C-1 1:32	F-1 1:128 F-2 1:16 F-3 1:128 F-4 1:128 F-5 1:32 M-1 1:8 M-2 1:8 C-1 1:16 C-2 1:16 C-3 1:8 F-6 1:16 F-7 1:8 F-8 1:16	F-1 1:128 F-2 1:32 F-3 1:128 F-4 1:64 F-5 1:32 M-1 1:8 M-2 Neg. C-1 1:8 C-2 1:16 C-3 Neg. F-6 Neg. F-7 Neg. F-8 1:32 F-9 1:16 C-4 1:8 C-5 1:8 C-6 1:16 H-1 1:8	F-1 1:256 F-2 1:32 F-3 1:128 F-4 1:64 F-5 1:32 M-1 S M-2 Neg. C-1 S C-2 S C-3 Neg. F-6 Neg. F-7 Neg F-8 1:8 F-9 S C-4 S C-5 1:8 C-6 Neg. H-1 S F-10 1:512 F-11 1:256

F=adult female
M=adult male
C=calf
H=heifer
S=slaughtered

TABLE 4—Bovine Q Fever Studies in Ohio—Results of Laboratory Animal Inoculation Tests

Cow tested and serum titer at time of test	Material tested	Guinea pig Inoculation test
F-1	Milk	+
1:256	Placenta	−
F-2	Milk	+
1:8		
F-3	Milk	+
1:256		
F-4	Milk	+
1:28		
F-5	Milk	−
1:64	Placenta	−
F-6	Milk	+
1:512	Placenta	+
F-7	Milk	+
1:256		
F-8 F-9	Milk	+
1:64 1:64	(pooled sample)	
L-1	Milk	+
1:128		
H-1	Milk	+
1:64		

logically positive cows, two were positive at titer of 1:8. When retested at a later date, both were negative.

2) In Q fever complement-fixation tests on 354 specimens received, in the last four years, by the Ohio Department of Health laboratory from Ohio physicians, two were positive in low titer. One of these was followed epidemiologically and the person was found not to have acute Q fever.

3) Serological examination of 55 slaughterhouse workers in two packing plants in Columbus, revealed no reactors.

4) Of 265 veterinarians throughout the state, 16 had low titers; four titers of 1:16; three, 1:8; and nine, 1:4.

DISCUSSION

While Q fever has been demonstrated in a small number of dairy cattle in Ohio, the investigation of a reasonably representative sample of the bovine population strongly suggests that the infection is limited to a few herds in certain areas of the state. Although the percentage of cattle infected in any area does not approach that demonstrated in endemic areas of California,[4] enzootic foci are suggested. Further delineation of the extent and distribution of areas of infection are under way.

The possibility of spread of the infection and the establishment of new enzootic foci through the congregation of cattle from different herds are suggested by this data.

Absence of the infection in persons in contact with infected herds is probably due to the small numbers of infected cattle in any one herd. It is possible that husbandry practices in Ohio prevent or delay transmission, but we have no evidence to support this explanation and consider it unlikely. The California experience suggests that if the level of bovine infection reaches 5 to 10 per cent in a given area, endemicity may be expected. An endemic potential in Ohio warrants observation and further study.

On the basis of the work presented here, it has been recommended to the Ohio Departments of Health and Agriculture that a Q fever surveillance program be established.

SUMMARY

1) Infection with *Coxiella burnetii*, the causative agent of Q fever, has been established in Ohio dairy cattle.

2) Transmission of the infection within a dairy herd has been demonstrated, and the possibilities of herd-to-herd transmission through contact has been suggested.

3) The distribution of infection has suggested the presence of enzootic foci of bovine infection.

4) Limited investigations have failed to demonstrate infection in man but a situation of potential endemicity is considered to exist.

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Q Fever in Man.—Q fever was first detected in Great Britain in 1949. Its prevalence in certain areas suggested sheep as an important reservoir of infection. *Rickettsia burneti* was isolated from the wool and the uterine placenta of sheep in the area. The disease was generally systemic, ranging from subclinical to severe. Most infections were in farmers, shepherds, wool-sorters, and slaughterhouse workers in contact with infected material.—*Brit. Med. J., Nov. 24, 1956.*

Surface Tension, pH, and Bloat

The influence of various factors on surface tension and pH of rumen fluid of cattle was investigated at Iowa State College. While the pH of samples collected orally was higher than for samples collected from the semisolid stratum, through a rumen fistula, the surface tension values of these two samples were similar. Water and saliva were the only additives to rumen fluid which increased surface tension.

Of the various therapeutic products examined, turpentine, defoaming agents of the metal silicone and fatty acid types, and two detergents markedly reduced the surface tension of the rumen fluid.—*J. Anim. Sci., Feb., 1957.*

Protein Requirements of Animals

Although the quantitative need for protein (amino acids) for maximum growth is somewhat controlled by genetic factors, the pattern is remarkably similar among the different species. Proteins are synthesized from approximately 19 amino acids usually supplied as dietary proteins. They are broken down into amino acids, absorbed, then recombined into specific proteins. No protein can be made unless every amino acid of which it is composed is immediately available at the site of synthesis; therefore, protein formation is limited by the amino acid available in the smallest amounts. In other words, protein synthesis is "governed by the law of the minimum."

Living cells are being constantly broken down and rebuilt from amino acid recovered from the hydrolysis of previous tissue protein plus those supplied in the diet.

The amino acids needed in the diet of nonruminating animals and the quantities of each for different animals at various times of their life cycles, is now known. The amino acid requirements for adult maintenance are lower (sometimes less than 10%) than the quantity needed for growth.—*Borden's Rev. Nutr. Res., Nov., 1956.*

Dietary Protein and Rumen Acids.—Nine lactating cows were fed three levels of protein, in a change-over design experiment, and samples of rumen liquid were obtained on three consecutive days, about the thirteenth and twentieth day of feeding each ration. A high level of protein was followed by an increase in the volatile fatty acids, except the "higher acids." When the protein was further increased, the percentage of acetic acid and "higher acids" decreased, while the percentage of butyric acid increased. Comparison of the data obtained after 13 and 20 days indicated that adjustments in the rumen to the ration changes were not complete in two weeks.—*J. Dai. Sci. (Jan., 1957)* : 75-80.

Iodinated Casein for Brood Sows

Because of the importance of a good milk supply for newborn pigs, three groups of sows, at Iowa State College, were fed iodinated casein at levels of 50, 100, and 200 mg. per pound of ration, starting three days before farrowing and continuing for one week. Pigs nursing sows fed the 100-mg. level gained 27 per cent more during the first week than pigs in the control group. There was no increase in pig gains in the group fed 50- and 200-mg. levels.

Iodinated casein, made from milk protein and iodine, contains about 1 per cent thyroxine. Sows fed the 200-mg. level showed an increase in their breathing rate and rectal temperatures. Whether the increased quantity of colostrum results in an increased antibody content has not been determined.—*Successful Farm. (April, 1957): 86.*

Values of Different Phosphates for Swine.—When several phosphates were fed to pigs for 56 days after weaning, dicalcium phosphate was associated with greater gains that monocalcium phosphate, bone meal, or other forms of phosphate. Its value was further increased when it was fed with fluorine. Blood phosphorus values were lower, and stiffness and weakness of the legs and back appeared earlier as well as more frequently and severely, when the soft phosphates were fed.—*J. Anim. Sci. (Nov., 1956)* : 1241.

Silage Feeding and Semen Production.—One of each of four pairs of identical twin bull calves, at the Pennsylvania Agricultural Experiment Station, was fed a ration of corn silage and hay and the other was fed concentrate and hay, from 13 to 112 weeks of age. The growth, attainment of sexual maturity, and the quantity and quality of semen produced were not affected.—*J. Anim. Sci., Feb. 1957.*

Teaching Public Health in Veterinary Medical Schools

GUEST EDITORIAL

The interest in public health shown by our veterinary medical institutions should be shared by our whole profession if we are to properly assume responsibilities for preventive, as well as for curative, veterinary medicine. The key individual in the whole endeavor of preventing disease is the veterinary practitioner.

Today, no state or large local health department can afford to be without a public health veterinarian on its staff. Even the smallest local health department should have adequate veterinary consultation from a local practitioner. However, to establish the veterinary profession as a member of the entire public health group, the practitioner must have a comprehensive grasp of the problems involved and a clear idea of what he can contribute.

One reason for human medicine receiving so much support for public health, research, and other activities is that their reporting system of morbidity and mortality pinpoints the problems and the problem areas. While a number of states have devised means for similar reporting of animal diseases, the degree of success varies. Such reporting would doubtless be far more satisfactory if present practitioners had received more training in public health. Training in public health methods should provide an understanding of the value of reporting morbidity and mortality for all animal diseases.

The Veterinary Medical School

One or two formal courses in public health or veterinary public health in our colleges will not in itself prepare the veterinary practitioner to take his place in this work with the practitioners of other professions. There must be in addition a continuous educational process related to his responsibility to the community, state, and country. Thus, the relationship between animal and human disease must be constantly emphasized in every department of a veterinary college, on every possible occasion, to stress the public health implications of the subject being taught.

To make this concept work, there should be on every veterinary faculty an individual who has had actual public health experience and who has taken advanced work in a school of public health. This individual would act as the catalyst: (1) integrating those courses which have a direct bearing on public health activities; (2) helping each school area to emphasize the public health implications; and (3) impressing upon the undergraduate veterinary student the importance of his activities in relation to health generally.

A stereotyped, textbook-lecture course on public health will not suffice; it must include demonstrations in the field and observation of public health activities. Such teaching should provide future practitioners at the grass roots of our profession with a knowledge of public health and an understanding of their responsibilities to the community, in cooperation with other medical professions and community leaders.

The School of Public Health

The role of the public health school is to weld diverse disciplines into a smooth working team with a common approach to health problems. Our veterinary institutions can not bring together all of the disciplines which form the basic concepts of public health. The physician, dentist, veterinarian, nurse, and sanitary engineer should receive their special public health training together in the seminar type of classes, where representatives of the various disciplines have an opportunity to bring out in discussion their opinions from their own professional points of view. This is the only way, in my opinion, that a veterinarian can receive proper graduate training in public health work.

For a veterinary college to embark upon a program of granting a master's degree in veterinary public health would be a grave mistake. The recent marked development, in the use of graduate veterinarians in the field of public health generally, does not mean that we are in a position to adequately train individuals in the specific

This editorial is based on the paper Dr. Thorp presented at the Ninety-Third Annual Meeting of the AVMA in San Antonio, Oct. 15-18, 1956. He is director of the School of Veterinary Medicine, University of Minnesota, St. Paul.

field of public health any more than is the school of medicine, engineering, dentistry, or nursing.

A careful comparison of curriculums in the various schools of public health with those, on a graduate level, of schools of veterinary medicine shows clearly that we could not do as good a job in training an individual for either broad preventive medicine, or for administrative veterinary medicine, as can be done in a school of public health.

Discussions with individuals from the Department of Agriculture, who are genuinely interested in furthering the training of their key staff members, indicate that the training they desire can be given much better in a school of public health. Required courses leading to an advanced degree in public health include: public health administration, epidemiology, statistics, sanitation, public health nursing, and health education and community organization. To this nucleus of required courses which all advanced students should take together, each professional group adds elective courses of special interest from its respective field.

Some may wonder why a veterinarian should be required to take a course in public health nursing. However, let us suppose a field study is to be made of brucellosis, toxoplasmosis, or any other zoonosis. Such a study, which would probably involve persons associated with animals on the farm or in the packing plant, would require using the whole public health team. This could involve the public health nurse who may assist in obtaining blood samples, making certain observations, and obtaining case histories. A knowledge and understanding of the other health professions is essential if animal and human health problems of mutual concern are to be effectively solved with the veterinarian as a contributing member of the health team.

We have long tried to justify animal disease research on the basis of agricultural economics. However, beginning with the tuberculosis eradication program and continuing ever since, unless there has been a public health aspect, the results have been limited.

If veterinary medicine is ever to get into the major leagues for disease control and research, the training beyond the D. V. M. degree in a school of public health seems to be one approach. It should focus the attention of the other medical professions on the value of veterinary medicine with its broad approach to human and animal disease control.

A further advantage is that the graduate from a school of public health could be employed in numerous fields and not be confined to the relatively few available administrative positions offered by the state and federal departments of agriculture.

SUMMARY

Undergraduate training for the doctor of veterinary medicine should place emphasis on the role of the practitioner, with special public health courses coordinated with the public health aspects of all courses throughout the four-year curriculum.

Veterinary schools should not establish a graduate course leading to a master of veterinary public health. Those veterinarians specializing in this field should complete a master of public health degree in a recognized school of public health.

The Master of Public Health degree, by virtue of its community health approach and its bringing together of the various disciplines in medicine, would meet the demand for veterinarians with training in administrative and preventive medicine desired by the U. S. Department of Agriculture and livestock sanitary boards.—*W. T. S. Thorp, D.V.M., St. Paul, Minn.*

Terminal Tower, 52-storied Cleveland landmark, with observation facilities for visitors on the forty-second floor. The Cleveland, headquarters hotel for the AVMA convention, is on the right.

ABSTRACTS

Infectivity of Blood from Anaplasma-Infected Cattle

Studies were made to determine the comparative infectivity for cattle of Anaplasma-infected blood collected from acutely infected and carrier animals. Varying dilutions of the infected blood made in normal serum were inoculated into splenectomized calves of a uniform size. The test animals were examined for evidence of anaplasmosis by hematological and serological methods. It was found that 1 ml. of a 10^{-6} dilution of blood collected from an animal with an acute case of anaplasmosis was sufficient to infect a susceptible animal. In contrast, the infectivity end point of carrier blood was 1 ml. of a 10^{-3} dilution.—[*D. W. Gates, P. A. Madden, W. H. Martin, and T. O. Roby: The Infectivity of Blood from Anaplasma-Infected Cattle as Shown by Calf Inoculation. Am. J. Vet. Res., 18, (April, 1957): 257-260.*]

Infectious Bovine Rhinotracheitis

Infectious bovine rhinotracheitis (IBR) is a new disease which occurs extensively in feedlot cattle and, to a lesser extent, in dairy animals in the western part of the United States. The authors describe the clinical, pathological, and epizootiological features of the disease and review the work which established it to be a distinct disease entity. The isolation of a hitherto undescribed virus from affected cattle, and the proof that it is the etiological agent of IBR, is reported in detail.—[*D. G. McKercher, J. E. Moulton, S. H. Madin, and J. W. Kendrick: Infectious Bovine Rhinotracheitis. Am. J. Vet. Res., 18, (April, 1957): 246-256.*]

Pathology of Bovine Mucosal Disease

The clinical, pathological, and histopathological findings in 14 natural and 6 experimental cases of a mucosal-type disease of young cattle are presented. Primary lesions were located in the epithelium of the gastrointestinal tract, interdigital skin and, rarely, in the turbinate mucosa. Ballooning degeneration was a feature of the stratified epithelial lesions, while coagulation necrosis and crypt abscesses characterized lesions in the columnar epithelium.

Morbidity in two outbreaks was near 100 per cent and mortality about 50 per cent. The pathological findings are compared with those in other bovine epithelial diseases.—[*James R. Rooney: Pathology of a Bovine Mucosal-Type Disease. Am. J. Vet. Res.,18, (April, 1957): 283-291.*]

Survey of Gastrointestinal Parasites in Cattle

A survey was made to determine the number and species of gastrointestinal parasites of cattle in North Carolina. Specimens were collected in 19 localities from 76 adults, 70 yearlings, and 35 calves. The genera of parasites in the gastrointestinal tract were counted and their incidence for each age group examined is given.—[*R. R. Bell: A Survey of the Gastrointestinal Parasites of Cattle in North Carolina. Am. J. Vet. Res., 18, (April, 1957): 292-294.*]

Glucagon for Hypoglycemia in Pregnant Ewes

The effects of glucagon on hypoglycemia and ketonemia were studied in fasted pregnant ewes. One or 2 μg. of glucagon per kilogram of body weight was administered intravenously. Glucagon caused a significant increase in blood glucose levels and a significant decrease in the level of blood ketone bodies of fasted pregnant ewes 45 minutes following administration.

Oxalacetic acid and glucagon were administered intravenously to produce their maximum responses simultaneously. There was an increased level of blood glucose and a decreased level of blood ketone bodies. However, there was no significant difference between the effects of the administration of oxalacetic acid and the combination of glucagon and oxalacetic acid.—[*Pauline Ho and E. F. Reber: Effects of Glucagon on Hypoglycemia and Ketonemia in Pregnant Ewes. Am. J. Vet. Res., 18, (April, 1957): 342-344.*]

Correction — Editors of "Avian Diseases"

When the JOURNAL (April 1, 1957:316) published an announcement of the journal, *Avian Diseases*, the names of Dr. Henry Van Roekel, of the University of Massachusetts, and Dr. D. W. Bruner, of Cornell University, were unintentionally omitted as associate editors.

FOREIGN ABSTRACTS

The Thiersch Skin Graft

Skin grafts in 5 dogs, 1 cat, and 4 horses proved that it is possible to apply this procedure to animals. Large skin defects healed in two to three weeks. The skin for the graft was taken from the lateral region of the chest and neck. The technique is described.—[*O. Uberreiter: The Thiersch Skin Transplantation (Graft): Munch. tierärztl. Wchnschr., 22-23, (1956): 435.*]—FRANK KRAL.

Tranquilizers Aid Examination of Bulls

A preliminary study of the tranquilizing properties of chlorpromazine and promethazine in large animals was undertaken at the veterinary school of São Paulo, Brazil. In their work with horses, they noticed the occurrence of some phenomena, among which was a relaxation and exposure of the penis.

Ten bulls, 8 suffering from pathological conditions of the penis requiring surgery, served as subjects for an experiment. A dose of 50 mg. of either drug per 100 kg. of body weight, administered intravenously, produced a relaxation of the retractor muscles of the penis in about ten minutes, permitting complete exposure of the penis

by simple manual traction. The animal usually remained standing but was in a state of somnolence that eliminated violent reactions and favored the painless manipulation and examination of the organs. Duration of this stage varied in individual animals from one to two and a half hours. The bulls remained quiet for several hours and in no case was there any complication or disturbance related to the use of these drugs.—[*E. A. Matera and A. V. Stopiglia.: Preliminary Observations on the Exposure of the Penis in Bovines with Chlorpromazine and Promethazine. Rev. Fac. Med. Vet., 5, (Dec., 1955): 411-416.*]—O. A. LOPEZ-PACHECO.

Treatment of Thysanosoma

The Taenia, *Thysanosoma actinioides,* belongs to the Cestoda class. It inhabits the small intestine and the biliary, hepatic, and pancreatic ducts of sheep and cattle.

Its control, particularly in sheep, is difficult. The vermifuges used have shown little effectiveness when the parasite is located in the intestines and none at all when in the above mentioned ducts. When in the ducts, the tapeworm obstructs the normal bile and pancreatic juice secretion, altering the digestion and nutrition of the animals and, in turn, rendering them more susceptible to other diseases.

A series of experiments involving treatment of 50 sheep infected with the parasites were carried on by the author at the experimental farm of Puno-Chuquibambilla, Peru, using phenothiazine, copper sulfate, nicotine sulfate, Rosembuch mixed vermifuge, and teniatol (Pitman-Moore).

The author concludes that teniatol is highly effective against this type of tapeworm regardless of its location in the intestines or the ducts, except for the disadvantage of its high cost.—[*F. Aguilar Mendoza: The Tenia, Thyzanosoma Actinioides, and Its Treatment. Ganaderia, 14-15, (Aug., 1956): 109-111.*]—O. A. LOPEZ-PACHECO.

BOOKS AND REPORTS

Veterinary Physiology

The fourth edition of this well-known textbook has been given a new, modern approach respecting the latest research results in biochemistry, particularly in the field of vitamins, hormones, and enzymes.

All other chapters, especially the parts dealing with blood and the circulatory and reproductive organs, explain in detail the latest points of view, giving valuable information for clinical and diagnostic use.

The book is well written and is supplemented with good illustrations. It should be of value for veterinary students and practitioners.—[*Veterinary Physiology (Lehrbuch der Veterinär-Physiologie). By Scheunert-Trautmann; revised by A. Scheunert, J. Bruggemann, V. Horn, and H. Hill. 186 illustrations. 1 table. Paul Parey, Verlagsbuchhandlung, (1) Berlin, SW 68, Lindenstr. 44-47. 1957. Price about $16.00.*]—FRANK KRAL.

Neoplasms of the Domesticated Mammals

This small text reviews most of the articles that have appeared in recent years on neoplasms of domesticated mammals including the tumors of the horse, mule, ox, pig, dog, and cat. Each chapter is devoted to the tumors affecting a certain system, including discussions for each species. The last of the 15 chapters includes the miscellaneous types of tumors not characteristic of any particular system. The author is a member of the Department of Pathology, Royal Veterinary College, London, England.

An extensive bibliography and index are included. There are no figures or tables.—[*Neoplasms of the Domesticated Mammals. By E. Cotchin. 100 pages. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England. 1956. Price about $2.80.*]—W. H. RISER.

The Nature of Brucellosis

The author, widely known for his investigation of brucellosis in man, presents an interesting review of the disease as it occurs in domestic animals and man. The book is well illustrated and, in addition, contains an extensive bibliography which furnishes stimulating reading. The reader's interest is further stimulated by the vast amount of clinical study of brucellosis in man, by the writer; also the report of interesting discoveries gained in an intensive research program. Dr. Spink has been a frequent participant in both state and national veterinary medical association programs.

This volume will be of special interest to physicians, workers in the field of public health, and medical students. It will also be valuable to veterinarians engaged in brucellosis control and eradication programs, to veterinarians engaged in brucellosis research, and to veterinary medical students.

It is general knowledge that brucellosis is primarily a disease of cattle, swine, and goats. This fact is supported by the work of Dr. Spink who reports that, fundamentally, brucellosis is not a disease of man but has its reservoir in animals and, therefore, is transmitted to people either directly or indirectly. The conclusion is that brucellosis in man will be prevented or eliminated only when the disease is eradicated in animals.

This book should provide a more complete understanding and appreciation of the true nature of the general subject of brucellosis, particularly as the problem is related to human health.

During the conquest of bovine tuberculosis, the veterinary medical profession received active support and full cooperation from the medical profession. The same is being continued in connection with the present battle against bovine brucellosis.—[*The Nature of Brucellosis. By Wesley W. Spink. 464 pages. University of Minnesota Press, Minneapolis, Minn. 1956. Price $8.00.*]—W. L. BOYD.

New Regional V.M.A. Organized

A new regional veterinary medical association, the Twin Carolinas V.M.A., was organized on March 14, 1957, in Rockingham, N. Car.

The new association is for veterinarians in both North and South Carolina. Meetings will be held the third Thursday of each month at 7:30 p.m. at the Orange Bowl Restaurant, Rockingham, N. Car.

Officers elected are R. E. Gandy, president; Cliff McLean, vice-president; and James R. Burgess, secretary-treasurer.

North Carolina veterinarians present at the organizational meeting were Cliff McLean, Southern Pines; T. C. Needham, Wilmington; Robert P. Huffman, Wilmington; R. G. Knight, Fayetteville; C. M. Speegle, Fayetteville; William Harward, Albemarle; Hugh Beasley, Southern Pines; Winston Tornow, Laurinsburg; R. E. Gandy, Rockingham; and James R. Burgess, Rockingham. Veterinarians from South Carolina present were Glenn Lawhon, Hartsville; D. M. Bedell, Bennettsville; C. R. Hinson, Bennettsville; and Julian Stith, Hartsville.

s/JAMES R. BURGESS, *Secretary.*

AMONG THE STATES AND PROVINCES

California

Alameda Contra Costa Association.—The regular meeting of the Alameda Contra Costa V.M.A. was held on Feb. 27, 1957.

The program consisted of a talk by Mr. E. R. Coarr on the use of radioactive materials for the diagnosis and treatment of various diseases. The procedures to be followed in the formation of an isotope committee and in securing radioactive materials were discussed.

s/GEORGE H. MULLER, *Secretary.*

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Orange County Association.—The Orange County V.M.A. recently elected the following officers for the 1957 term: M. W. Loge, Laguna Beach, president; Bart Baker, Santa Ana, vice-president; and H. M. Stanton, Tustin, secretary-treasurer.

s/H. M. STANTON, *Secretary.*

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State Board Examination.—The California State Board of Veterinary Medical Examiners will hold an examination on June 13-15, 1957, at Davis. For further information address: Gaylord K. Cooke, 1932 Yosemite Rd., Berkeley 7, Calif., secretary.

District of Columbia

District Association.—The District of Columbia V.M.A. held its second quarterly meeting on March 19, 1957, at Dart Auditorium, Armed Forces Institute of Pathology.

The program for the evening consisted of a film, "Stress and the Adaptation Syndrome," and a case report, "Treatment of a Case of Lymphosarcoma in the Dog with Nitrogen Mustard," by Drs. I. G. Cashell, W. I. Gay, L. Lombard, and W. H. Eyestone.

s/WILLIAM I. GAY, *Secretary.*

Illinois

State Association.—The seventy-fifth annual meeting of the Illinois State V.M.A. was held at the LaSalle Hotel, Chicago, on Feb. 25-27, 1957. Total registration was 806.

The program included the following out-of-state speakers: J. W. Bardens, Lowell, Ind.; W. M. Beeson, Lafayette, Ind.; W. O. Brinker, East Lansing, Mich.; C. F. Dykstra, Rock Rapids, Iowa; Sam Elmer, Richland Center, Wis.; J. J. Fishler, Elkhart, Ind.; Mr. L. E. Harris, Lincoln, Neb.; J. T. McGrath, Philadelphia, Pa.; I. A. Merchant, Ames, Iowa; C. L. Nelson, Jewell, Iowa; R. E. Nichols, Madison, Wis.; G. B. Schnelle, Boston, Mass.; K. W. Smith, Sioux City, Iowa; F. A. Spurrell, St. Paul, Minn.; and W. P. Switzer, Ames, Iowa.

Highlights of the convention included luncheons for the alumni of Iowa State College and the University of Illinois and a banquet during which Dr. John B. Jaffray was honored as the Illinois veterinarian of the year, and 16 members were awarded 50-year pins in recognition of 50 years or more of service to the profession.

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One of the 39 exhibits on display at the seventy-fifth annual meeting of the Illinois State V.M.A. was a collection of old veterinary instruments, some of which were homemade, used in the early days of veterinary practice in this country.

Dr. J. G. Hardenbergh, Executive Secretary of the AVMA made the presentations.

Officers elected for the 1957 term are P. T. Gambrel, Winnebago, president; T. M. Wise, Effingham, president-elect; C. M. Rodgers, Blandinsville, immediate past-president; R. P. Link, Urbana, treasurer; and C. B. Hostetler, Des Plaines, executive secretary.

s/C. B. HOSTETLER, *Executive Secretary.*

Indiana

Women's Auxiliary.—The thirteenth annual business meeting of the Women's Auxiliary to the Indiana V.M.A. was held in the Hoosier Room of the Hotel Severin in Indianapolis on Jan. 16, 1957, with approximately 60 members in attendance.

Mrs. Lowell W. Hinchman of Glenwood, presided.

Donations of $10 to the Memorial Fund and $50 to the Student Loan Fund, of the Women's Auxiliary to the AVMA, and $10 to the AVMA Research Fund were approved.

Greetings from Mrs. E. N. Moore, past-president, and Mrs. A. E. Coombs, president, of the AVMA Auxiliary, were read.

Mrs. J. J. Fishler of Elkhart, delegate to the convention in San Antonio last October, reported on the business transacted there. Indiana, one of the 14 states to qualify for the national honor roll, ranked fifth in membership with 241 members at that time.

Mrs. Ray Worley of South Bend reported that the membership in the state had increased to 228 during the year.

The new officers elected were as follows: president, Mrs. C. C. Donelson, Thorntown; first vice-president, Mrs. R. W. Worley, South Bend; second vice-president, Mrs. W. E. Welbourne, Winchester; secretary, Mrs. Howard Glass, Indianapolis; and treasurer, Mrs. Ivan Meyers, Kirklin.

s/MRS. FRANK GOSSETT, *Secretary.*
MRS. LOWELL W. HINCHMAN, *President.*

Iowa

Dr. Sunberg Acting State Veterinarian.—Dr. Laurence A. Sunberg (ISC '31) is serving as acting state veterinarian since the death, on April 2, 1957, of Dr. H. U. Garrett. Dr. Sunberg, in general practice at Laurens, Iowa, for 25 years, has recently been serving as assistant state veterinarian.

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Eastern Iowa Auxiliary.—The annual meeting of the Women's Auxiliary to the Eastern Iowa V.M.A. was held on Oct. 4-5, 1956, at the Hotel Sheraton-Montrose in Cedar Rapids, in connection with the forty-third annual meeting of the association.

At the business meeting on Thursday, the following officers were elected for the ensuing term: Mrs. F. E. Brutsman, Traer, president; Mrs. A. J. McIntosh, LaPorte City, vice-president; Mrs. L. H. Bell, Davenport, secretary; Mrs. K. H. Randolph, Lost Nation, treasurer; and Mrs. J. M. Barclay, Brooklyn, president-elect. Mrs. A. J. McIntosh was chosen delegate to the AVMA Women's Auxiliary meeting in Cleveland next August.

At the banquet in the evening, Dr. R. E. Shope of the Rockefeller Institute for Medical Research, New York, gave an account of his travels through Russia in 1956. Dr. Shope was one of a group of medical men chosen to represent the United States to view medical progress and institutions in Russia.

Kansas

Dr. Bower Is Kansas Veterinarian of the Year

Dr. T. J. Leasure (left), Lawrence, president of the Kansas V.M.A., presented Dr. Charles W. Bower (center), Topeka, with the Kansas V.M.A.'s first "veterinarian of the year" recognition as Brig. Gen. Wayne O. Kester (right), president of the AVMA, looked on.

The presentation was made at the annual banquet held on Feb. 7, 1957.

Kentucky

State Board Examination.—The Kentucky Board of Veterinary Examiners will hold a special examination on Monday, June 17, 1957, at Frankfort. The regular examination and meeting will be held July 29. For further information write: J. K. Bushnell, Paris, Ky., secretary.

Maryland

State Board Examination.—The State Board of Veterinary Medical Examiners of Maryland announces that the veterinary medical examination will be held on Wednesday, June 19, 1957, starting promptly at 8:00 a.m.

Candidates may secure application forms from Dr. Harold S. Gober, secretary, 5400 Park Heights Ave., Baltimore 15, Md. All applications must be returned to the secretary no later than June 1, 1957.

Michigan

Southeastern Association.—The March meeting of the Southeastern Michigan V.M.A. was held on March 27, 1957. The program included a showing of the film "Antibiotic Sensitivity Testing" and reports by Drs. Stephen Kelly, president-elect of the Michigan State Association, and Charles Hodder, program chairman for the state association meeting to be held in June.

Officers elected for 1957 are Jack Emery, president; Gilbert Meyer, Detroit, vice-president; Lyle Hartrick, Royal Oak, treasurer; and Louis Rossoni, Dearborn, secretary.

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State Board Examination.—The State Board of Veterinary Examiners will hold examination for state license June 10-11, 1957, at Lansing. The examination will be written, practical, and oral. Applications must be on file at least 15 days before the examination, accompanied by the $25 fee. For application blank and information, address: Lee Davisson, State Veterinarian, 641 Lewis Cass Bldg., Lansing 13, Mich.

Missouri

State Board Examination.—The Missouri State Board Examination will be held May 27-28, 1957, at the veterinary clinic, University of Missouri, Columbia. For application blanks write: L. A. Rosner, P. O. Box 630, Jefferson City, Mo.

Montana

State Board Examination.—The Montana Board of Veterinary Medical Examiners announces that the State Board Examinations will be held on June 24-26, 1957, at the Montana Veterinary Research Laboratory Auditorium, Montana State College, Bozeman.

Application blanks may be obtained from J. W. Safford, secretary-treasurer, Montana Board of Veterinary Medical Examiners, Capitol Station, Helena. Applications must be in the hands of the board at least ten days preceding the date of the examination.

New Jersey

Southern Association.—Officers of the Southern New Jersey V.M.A. elected for the year 1957 are O. K. Fox, Moorestown, president; F. W. Wolfe, Salem, vice-president; R. M. Sauer, Westmont, secretary; and F. J. Olbrich, Blackwood, treasurer.

s/R. M. SAUER, *Secretary.*

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State Board Examination.—The State of New Jersey Board of Veterinary Medical Examiners will hold an examination at 9 a.m. on June 28 and 29, 1957, in the Assembly Chamber of the State House, Trenton. Particulars and application may be secured from: Joseph A. S. Millar, P. O. Box 172, Deal, N. J., secretary.

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held on April 3, 1957.

The program included the showing of the motion picture "Stress and the Adaptation Syndrome," courtesy of Charles Pfizer Laboratories, and two speakers: Dr. David L. Coffin, director of research, Margaret M. Caspary Center for Veterinary Research, New York; and Dr. Robert B. McClelland, president, New York State Veterinary Medical Society.

s/C. E. DECAMP, *Secretary.*

Ohio

State Board Examination.—The State Board of Veterinary Examiners of Ohio announces that the Ohio veterinary medical examination will be held on June 4-5, 1957, in the Clinic Building, College of Veterinary Medicine, Ohio State University, Columbus. Applicants must be present at 8:00 a.m. on June 4.

All application forms must be returned to the secretary not later than May 4, 1957, and may be secured from the Office of the Secretary Ex-Officio, Division of Animal Industry, Room 720, State Building, Columbus 15, Ohio.

Oregon

State Association—At the winter meeting of the Oregon Veterinary Medical Association, held in Portland on Feb. 1-2, 1957, the following officers were elected for the ensuing term: K. J. Peterson, Salem, president; W. H. Steele, Portland, president-elect; and E. L. Holden, Oswego, secretary-treasurer.

Program speakers included Drs. C. L. Blakely, Boston, Mass.; Irwin Erickson, Puyallup, Wash.; R. V. Johnson, Indianapolis, Ind.; D. L. Moyer, Portland; and O. W. Schalm, Davis, Calif.

s/EDWARD L. HOLDEN, *Resident Secretary.*

Washington

Conference for Veterinarians.—The ninth annual conference for veterinarians sponsored by the College of Veterinary Medicine, State College of Washington, was held on April 8-10, 1957, in Pullman.

Guest speakers included Mrs. Robert Bartow, Pullman; W. O. Brinker, East Lansing, Mich.; J. D. Dwyer; Carl M. Ecklund, M. D., Hamilton, Mont.; Joseph L. Ellis, Olympia; Irwin Erickson, Olympia; Harold J. Hill, Fort Collins, Colo.; M. K. Jarvis, Omaha, Neb.; U. S. Grant Kuhn, Oak Ridge, Tenn.; Robert T. McCarty, Dallas, Texas; Francis J. Mulhern, Washington, D. C.; John D. Nelson, Santa Clara, Calif.; James P. O'Connell, Coeur d'Alene, Idaho; Elwyn Schwartz, Moscow, Idaho; and Richard E. Shope, New York.

• • •

State College Receives Films.—A new cata-

logue of films and film strips devoted to the animal sciences has been issued by the film library of the State College of Washington.

Distribution of films in the catalogue is limited to the 11 far-western states. The catalogue can be obtained by writing to the Audio-Visual Center, State College of Washington, Pullman.

FOREIGN NEWS

Italy

Artificial Insemination Symposium Held.—A symposium on the zootechnical and sanitary results and outlooks of artificial insemination was held on April 23-24, 1957, in connection with the thirty-fifth International Samples Fair at Milan, Italy.

Professor T. Bonadonna, founder and director of the "L. Spallanzani" Institute and president of the Italian Society for Progress in Zootechny, presided at the symposium.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. are reported as of March 15, 1957.

TRANSFERS

A. H. Abramson, from Camden, N. J., to Norma, N. J.
Kenneth H. Fritts, from Worthington, Minn., to Fort Worth, Texas.
William L. Jones, from Wilmar, Minn., to Worthington, Minn.
Claude H. Kaylor, from Monroe City, Mo., to Chicago, Ill.
Gregory Lozynskyj, from Forest, Miss., to Rockford, Ill.
Leland D. Mechem, from Worthington, Minn., to Tripoli, Iowa.
Leland D. Mechem, from Tripoli, Iowa, to Clarion, Iowa.
Joe B. McKee, from San Antonio, Texas, to Brownsville, Texas.
Milton A. Nevens, from Winchester, Va., to Richmond, Va.
Bill Parker, from Texarkana, Texas, to Butte, Mont.
Leonard B. Plunk, from Chicago, Ill., to Athens, Ala.
Philip A. Ray, Jr., from Denver, Colo., to Sioux Falls, S. Dak.
Thomas N. Reid, from New York, N. Y., to Newark, N. J.
Otis R. Roberts, from Fairbury, Neb., to Mentone, Ind.
Alfred F. Sanders, from Chicago, Ill., to Johnson Creek, Wis.
George W. Spangler, from Topeka, Kan., to Lincoln, Neb.
Charles E. Teague, from Tripoli, Iowa, to Worthington, Minn.
Russ W. Williams, from Fayetteville, Ark., to Eldorado, Ark.
William R. Winner, from Madison, Wis., to Fort Worth, Texas.
Nathan Yarbrough, from Storm Lake, Iowa, to Forrest, Miss.

DEATHS

Charles W. Neal, Siloam Springs, Ark.

STATE BOARD EXAMINATIONS

CALIFORNIA—June 13-15, 1957, Davis. Gaylord K. Cooke, 1932 Yosemite Rd., Berkeley 7, Calif., secretary.
FLORIDA—June 17-19, 1957, Miami. E. L. Matthews, P.O. Box 141, Palatka, Fla., secretary.
KENTUCKY—June 17 and July 29, 1957, Frankfort. J. K. Bushnell, Paris, Ky., secretary.
MARYLAND—June 19, 1957, Baltimore. Dr. Harold S. Gober, 5400 Park Heights Ave., Baltimore 15, Md., secretary.
MICHIGAN—June 10-11, 1957, Lansing. Lee Davisson, 641 Lewis Cass Bldg., Lansing 13, state veterinarian.
MISSOURI—May 27-28, 1957, Columbia. L. A. Rosner, P. O. Box 630, Jefferson City, Mo.
MONTANA—June 24-26, 1957, Bozeman. J. W. Safford, secretary-treasurer, Montana Board of Veterinary Medical Examiners, Capitol Station, Helena.
NEW JERSEY—June 28-29, 1957, Trenton. Joseph A. S. Millar, P.O. Box 172, Deal, secretary.
NEW YORK—June 12-13, 1957. Practical examination, Ithaca. Mr. James O. Hoyle, secretary, 23 S. Pearl St., Albany. Week of July 8, 1957. Written examinations: New York City, Albany, Syracuse, Buffalo, Rochester.
NORTH CAROLINA—June 24-26, 1957. Asheville. Dr. James I. Cornwell, secretary, 65 Beverly Road, Beverly Hills, Asheville.
OHIO—June 4-5, 1957, Columbus. Office of the Secretary Ex-Officio, Division of Animal Industry, Room 720, State Office Building, Columbus 15, Ohio.
OKLAHOMA—May 20-22, 1957, Stillwater. R. E. Henry, Oklahoma Board of Veterinary Medical Examiners, Oklahoma City, Okla., secretary.
SOUTH DAKOTA—June 24-25, 1957. Pierre, Glenn B. Rea, Livestock Sanitary Board, State Office Building, Pierre, S. Dak., secretary.
TENNESSEE—June 24-25, 1957. Nashville. Dr. W. O. Greene, secretary, State Office Bldg., Nashville.
TEXAS—June 3-4, 1957. College Station. Mr. T. D. Weaver, executive secretary, Texas State Board of Veterinary Medical Examiners, 207 Capital National Building, Austin 16, Texas.

DEATHS

Star indicates member of AVMA

★**Richard H. Folsom** (UP '13), 65, Plum City, Wis., died on Feb. 18, 1957. Dr. Folsom had practiced in Plum City since 1915. He was a member of the AVMA.

He is survived by his widow and a son.

★**Harley U. Garrett** (KCV '14), 64, Des Moines, Iowa, died April 2, 1957. After receiving his D.V.M. degree, Dr. Garrett was in private practice in St. Charles, Iowa, for 32 years, until 1947, when he was appointed state veterinarian of Iowa. He was serving in that capacity at the time of his death.

Dr. Garrett served the State of Iowa with distinction and was an influential member of the U. S. Livestock Sanitary Association of which he was vice president. He was also a member of the advisory committee of the U. S. Department of Agriculture. He had been a member of the AVMA for 20 years and for ten years was a member of the Iowa Examining Board. Dr. Garrett is survived by his widow, two sons, and a daughter.

★**Gail E. Hawley** (MSU '50), 39, Terre Haute, Ind., died on March 16, 1957, from injuries suffered on March 6 in the crash of a chartered plane near Grant Park, Ill. Dr. Hawley was one of the original team of nutritionists and veterinarians employed at Charles Pfizer and Company to establish its Agricultural Research Center at Terre Haute.

Dr. Hawley was a member of the AVMA. He is survived by his mother and a brother.

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ORGANIZATION SECTION

Don't Miss the AVMA Convention
Cleveland—August 19-22, 1957

Cleveland Program Will Be Practical

The scientific programs arranged for the Ninety-Fourth Annual Meeting of the AVMA in Cleveland on Aug. 19-22, 1957, promises to offer subjects of immediate and practical value to every segment of veterinary medicine.

Closed-circuit television, presented through the courtesy of Allied Laboratories, Inc., and Radio Corporation of America, will be used to present program material in each of the six sections. A number of programs will be telecast simultaneously to more than one section meeting.

This is the seventh consecutive year these companies have collaborated in making television available for AVMA annual meetings.

This year's scientific program emphasizes the visual and panel-type presentations.

A total of 22 telecasts are planned.

The complete schedule for the six sections is as follows:

Monday, August 19

1:25 to 5 p.m.—General Practice, Research

Tuesday, August 20

8:30 a.m. to 12 noon—General Practice, Research

Tuesday, August 20

1:25 to 4:45 p.m.—Small Animal, Public Health

Wednesday, August 21

8:30 a.m. to 12 noon—Small Animal, Poultry

Wednesday, August 21

1:00 to 4:55 p.m.—Surgery and Obstetrics, Public Health.

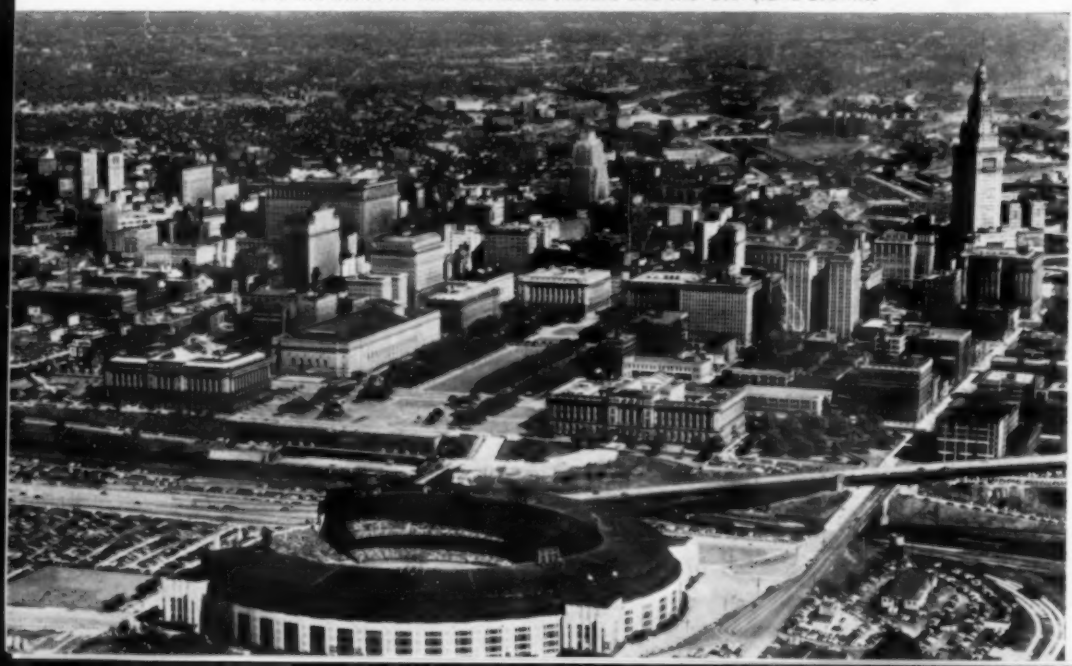
Thursday, August 22

8:30 a.m. to 12 noon—Surgery and Obstetrics, Small Animals, Poultry.

All of the scientific meetings will be held in the Cleveland Public Auditorium.

The July 1 issue of the JOURNAL will carry the complete program, with subjects, participants, and time schedules.

An air view of Cleveland, showing the Stadium in the foreground, which seats 80,000. It is the home of the Cleveland Indians and the Cleveland Browns.



STUDENT CHAPTER ACTIVITIES

Minnesota

Minnesota Student Chapter.—At the meeting held Feb. 4, 1957, Brig. Gen. Wayne O. Kester, president of the AVMA, gave a very informative and interesting talk on the effect of organized veterinary medicine in the future, military service as it affects the future, and the immediate prospects in veterinary medicine. Dr. R. Kitchell gave a report on the research activities in progress in the Division of Anatomy and Physiology at the University of Minnesota.

Suggestions for topics for coming meetings were received from chapter members by president L. Davis. Topics included business methods; establishing a mixed practice; bookkeeping methods in practice; relationships between veterinarians in a community; and public relations between the veterinarian and the community.

The annual spring party was held April 27, 1957, at the Northwood County Club.

s/JACK REGISTER, *Secretary.*

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The anabolic, protein-sparing effect of Anabolin helps overcome the effects of hormonal deficiencies or imbalances and strengthens the anabolic activities of the body. Anabolin is indicated in dogs of all ages to counter the catabolic effects of aging, injury, infection, faulty diet, surgery, parasitism.

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COMING MEETINGS

Kansas State College. Conference for veterinarians. School of Veterinary Medicine, Manhattan, May 26-28, 1957. E. E. Leasure, dean.

Texas A. & M. College. Conference for veterinarians. Texas A. & M. College, College Station, June 6-7, 1957. R. D. Turk, chairman.

Ohio State University. Annual conference for veterinarians. Ohio Union Building, Columbus, June 12, 1957. V. L. Tharp, director, Veterinary Clinics, chairman.

Wyoming Veterinary Medical Association. Annual meeting. Noble Hotel, Lander, June 15-17, 1957. J. F. Ryff, P. O. Box 960, Laramie, Wyo., secretary.

North Dakota Veterinary Medical Association. Annual meeting. Minot, N. Dak., June 17-18, 1957. Dean Flagg. 202 Teton Ave., Bismarck, N. Dak., secretary.

California State Veterinary Medical Association. Annual convention. Hotel Miramar, Santa Barbara, June 17-19, 1957. Charles S. Travers, 3004 16th St., San Francisco, Calif., secretary.

Idaho Veterinary Medical Association. Summer meeting. Shore Lodge, McCall, June 20-22, 1957. A. P. Schneider, 3025 N. Twenty-Third St., Boise, Idaho, secretary.

South Carolina Associations of Veterinarians. Summer convention. Fort Sumter Hotel, Charleston, June 20-22. Worth Lanier, York, S. Car., secretary.

Alberta Veterinary Medical Association. Annual convention, Lethbridge, Alta., June 21-22, 1957. H. C. Carlson, 9324 148th St., Edmonton, Alta., secretary.

South Carolina Association of Veterinarians. Summer meeting. Fort Sumter Hotel, Charleston, June 21-22, 1957. Worth Lanier, P. O. Box 345, York, S. Car., secretary.

Georgia Veterinary Medical Association. Annual meeting. Athens, June 23-25, 1957. C. C. Rife, 505 Lindbergh Drive, N. E., Atlanta 5, Ga., secretary.

Utah Veterinary Medical Association. Annual meeting. Logan, June 25-26, 1957. J. A. Thomas, P. O. Box 592, Provo, Utah, secretary.

Maritime Veterinary Association. Joint conference. Mount Allison University, Sackville, N. B., June 25-27, 1957. J. F. Frank, Division of Animal Pathology, Box 310, Sackville, N. B., chairman.

North Carolina Veterinary Medical Association. Annual meeting. Grove Park, Asheville, June 25-27, 1957. C. J. Lange, 3741 High Point Rd., Greensboro, N. Car., secretary.

Michigan State Veterinary Medical Association. Annual meeting. Leland Hotel, Detroit, June 26-27, 1957. Paul V. Howard, 4011 Hunsberger, N. E., Grand Rapids 5, Mich., secretary.

Maryland State Veterinary Medical Association. George Washington Hotel, Ocean City, June 27-28, 1957. John D. Gadd, Cockeysville, Md., secretary.

Montana Veterinary Medical Association. Summer meeting. Northern Hotel, Billings, June 28-30, 1957. G. A. Morrison, 316 Central Ave., Great Falls, Mont., secretary.

Mississippi State Veterinary Medical Association, Inc. Annual meeting. Hotel Heidelberg, Jackson, July 14-16, 1957. Harvey F. McCrory, Box 536, State College, Miss., secretary.

Kentucky Veterinary Medical Association. Annual meeting. Brown Hotel, Louisville, July 15-16, 1957. Robert H. Singer, 136 Shawnee Place, Lexington, Ky.

Iowa State College. Annual conference for veterinarians. Memorial Union, Ames, July 16-17, 1957. M. S. Hofstad. Veterinary Research Institute, Iowa State College, Ames, program chairman.

Vermont Veterinary Medical Association. Annual meeting. The Lodge at Smugglers Notch, Stowe, June 18-19, 1957. Dr. A. E. Janawicz, Department of Agriculture, Montpelier, Secretary.

Canadian Veterinary Medical Association. Annual meeting. Hotel Georgia, Vancouver, B. C., July 22-24, 1957. James Archibald, Ontario Veterinary College, Guelph, Ont., vice-president.

Colorado Veterinary Medical Association. Annual meeting. LaCourt Hotel, Grand Junction, Aug. 9-10, 1957. G. H. Gilbert, 5500 Wadsworth Blvd., Arvada, Colo., secretary.

American Veterinary Medical Association. Annual meeting. Cleveland Auditorium, Cleveland, Ohio, Aug. 19-22, 1957. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Washington State Veterinary Medical Association. Annual meeting. Monticello Hotel, Longview, Sept. 9-10, 1957. William F. Harris, 1102 E. Main St., Puyallup, Wash., secretary.

New York State Veterinary Medical Society. Annual meeting. Hotel Statler, Buffalo, Sept. 11-13, 1957. M. H. Covert, 138 Inglewood Dr., Rochester 19, N. Y., secretary.

New England Veterinary Medical Association. Annual meeting. Equinox House, Manchester, Vt., Oct. 6-9, 1957. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Purdue University. Annual short course for veterinarians. Purdue University, West Lafayette, Ind., Oct. 9-11, 1957. L. M. Hutchings, secretary.

Florida State Veterinary Medical Association. Annual meeting. Fort Harrison Hotel, Clearwater, Oct. 13-15, 1957. Robert P. Knowles, 2934 N.W. 17th Ave., Miami 37, Fla., secretary.

University of Missouri. Annual short course for graduate veterinarians, Oct. 14-15, 1957, School of Veterinary Medicine, University of Missouri, Columbia. Cecil Elder, chairman.

Eastern Iowa Veterinary Association. Annual meeting. Hotel Sheraton-Montrose, Cedar Rapids, Oct. 17-18, 1957. F. E. Brutsman, Traer, Iowa, secretary.

Southern Veterinary Medical Association. Annual meeting. Hotel Roanoke, Roanoke, Va., Oct. 27-30, 1957. A. A. Husman, P. O. Box 91, Raleigh, N. Car., secretary.

Cornell University. Nutrition conference. Cornell University, Ithaca, N.Y., Oct. 31-Nov. 1, 1957. J. K. Loosli, Stocking Hall, Cornell University, Ithaca, N.Y., chairman.

Minnesota Veterinary Medical Association. Annual meeting, St. Paul, Jan. 20-22, 1958. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.

Kansas Veterinary Medical Association. Annual meeting. Hotel Broadview, Wichita, Feb. 9-11, 1958. K. Maynard Curts, 5236 Delmar Ave., Kansas City 3, Kan.

Foreign Meetings

British Veterinary Association, Annual congress. University of Cambridge, Cambridge, England, Aug. 25-31, 1957. Mr. F. Knight, 7, Mansfield St., Portland Place, London, W. 1, general secretary.

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Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2. Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda Contra Costa Veterinary Medical Association, last Wednesday of each month. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Maurice L. Boevers, 3394 Mt. Diablo Blvd., Lafayette, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of

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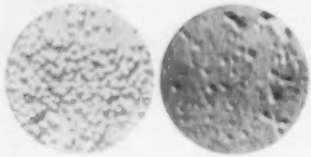

RABIES: (*left*) electron micrograph of rabies virus. X 40,000.

DISTEMPER: (*right*) electron micrograph of distemper virus. X 144,000.

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. . . single-injection vaccine for immunization against cat distemper (feline infectious enteritis, malignant panleucopenia, infectious feline agranulocytosis, etc.) Femulgen is a homologous vaccine, prepared from the tissues of young susceptible cats inoculated with virulent feline distemper virus. This virus is extracted, inactivated wth formalin and suspended in an oil emulsion. *Supplied in* 5 x 1 cc.—1 dose vials, with disposable syringe.

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. . . immediate passive immunity against canine distemper and infectious hepatitis. *Supplied in* 100 cc. vials.

CANINE DISTEMPER VACCINE

. . . modified live virus, chick embryo origin, for immunization against distemper in dogs. *Supplied in* 6 x 2 cc.—1 dose vials.

10 years of tests prove dogs thrive on dry self-feeding method!

Ten years of tests on 21 breeds of dogs at the Gaines Research Kennels indicate that dogs can be raised and maintained successfully on the dry self-feeding method. The dogs were allowed free access to dry meal-type food and fresh drinking water at all times.

THE 21 BREEDS INCLUDED IN THESE TESTS WERE:

Basenji	Manchester Terrier
Boxer	Golden Retriever
American Cocker	Labrador Retriever
English Cocker	Scottish Terrier
Dachshund	English Setter
Dalmatian	Irish Setter
Fox Terrier (Smooth & Wire)	Shetland Sheepdog
	English Springer Spaniel
Great Dane	Welsh Corgi (Cardigan)
German Shepherd	Welsh Terrier
Kerry Blue Terrier	

BEFORE AND DURING THE TESTS,

all dogs were examined as to their weight and general physical condition. These same dogs were maintained entirely by the self-feeding method on one type of dry dog food. In another set of tests, other dogs were fed a controlled diet each day along with the continuous availability of dry food. Hundreds of individual dogs as well as several generations of various breeds were raised successfully on each of these respective diets.

IN THE CASE OF DRY SELF-FEEDING,

as well as self-feeding supplemented by a controlled diet, the dogs were maintained in a condition superior to that afforded by a good typical kennel diet. The dry self-feeding method proved especially successful in the case of bitches with large litters. The bitches were able to supply adequate amounts of milk for the puppies and, at the same time, keep themselves in excellent condition. By the sixth week—or normal weaning age—the puppies were already eating sizable quantities of dry food, and the "poor doers" responded rapidly when put on a self-feeding schedule.

SAVINGS UP TO 90% IN TIME AND LABOR

Aside from the nutritional advantages of the self-feeding program, it was found in these tests that there were savings up to 90% in the time and labor required to feed the dogs. Gaines Meal was used exclusively in these dry self-feeding tests because its new *homogenized* form makes it ideal for such a feeding method. It is made up entirely of clean granules, each containing a completely balanced amount of every food essential dogs are known to need. Unlike most other meals, in which dogs are apt to scatter the less palatable, powdery ingredients in search of the tastier, flakier particles, every granule of Gaines is appetizing and nutritionally complete. *Gaines insures uniform, balanced nourishment—no matter how you feed it!*

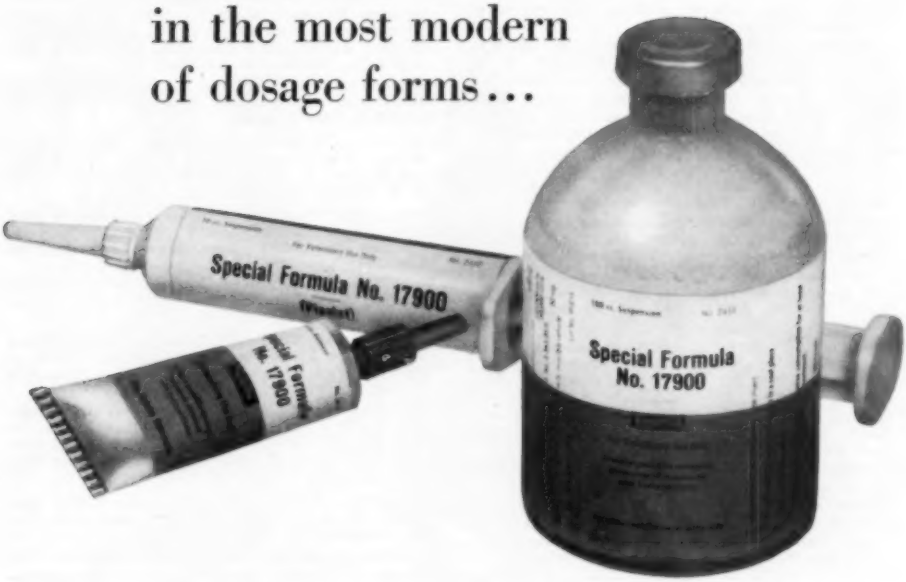
SEND FOR FREE INFORMATION

The dry self-feeding tests are continuing at the Gaines Research Kennels, opening up a new phase in dog feeding methods. If you are interested in knowing more about the self-feeding method, Gaines will be pleased to send you without obligation a report on the tests as well as information about types of feeders. Just write to Gaines Research Kennels, Box 164, Dept. A, Kankakee, Ill.

A Product of General Foods

NEW HOMOGENIZED GAINES MEAL

The most modern in mastitis formulas in the most modern of dosage forms...



SPECIAL FORMULA NO. 17900*

the formula **Neomycin**
Penicillin
Polymyxin
Powerful antibiotic combination effective against all the organisms commonly associated with mastitis.

Hydrocortisone
Powerful anti-inflammatory action to reduce swelling and fibrosis, and thereby preserve immediate and future milk production.

the dosage forms

Plastet*
A suspension in a 10 cc. disposable plastic syringe

Tube
10 Gm. of milk-miscible ointment in a collapsible tube

Multidose Vial
A suspension in a 100 cc. rubber-capped vial

Special Formula No. 17900 is available only to veterinarians

Upjohn Veterinary Medical Department/Kalamazoo, Michigan

*Trademark

Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant. P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. Harold A. Tennant, Atmore, Ala., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. Ross E. Evans, 5215 S. Dixie Highway, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

East Central Iowa Veterinary Medical Society, the second Tuesday of every month. Dr. W. T. Rugger, Oxford, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Winneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc.,

The Baron wanted him shot

"You," said the suavely arrogant young baron in the blue and silver *Generalstab* uniform, "are a British spy. And," pointing his hand like a pistol, "you know what that means."

What it meant was that the most daring newsman of his day, counting on America's 1914 neutrality, had wandered too far behind German lines. And made a new acquaintance who was now politely insisting on having him shot.

But 24 hours later, Richard Harding Davis nonchalantly rode back to Brussels in a German general's limousine.

By that time, Davis had become an old hand at getting out of tight spots. It was, after all, his sixth war. As early as his third, he had been officially commended for cool courage and offered a commission.

Novelist, playwright, reporter, world-traveller, Richard Harding Davis was the idol of his generation. And his clear-headed adventurousness, his love of fair play, would have made him one today. For America's strength as a nation is built on just such qualities.

And America's Savings Bonds are literally backed by them. It is the courage and character of 170 million Americans that make these Bonds the world's finest guarantee of security.

For in U.S. Savings Bonds your principal is *guaranteed safe*, to any amount—and your rate of interest *guaranteed sure*—by the greatest nation on earth. Buy U.S. Savings Bonds regularly where you bank or through the Payroll Savings Plan where you work. And hold on to them.

PART OF EVERY AMERICAN'S SAVINGS BELONGS IN U.S. SAVINGS BONDS

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Highstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. F. B. Duke, 49 Taylor St., High Bridge, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College. Annual conference for veterinarians. Cornell University, Ithaca. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

NEW antibacterial, antifungal ointment

A new bactericidal *and* fungicidal agent, Triocil is especially valuable in the treatment of skin infections and other types of dermatoses, otitis externa, eczemas, balanitis, cuts, lacerations, gland infections, and other skin conditions where infection is a factor.

Triocil has these important advantages:

- a strong affinity for tissue, prolonging its action.
- exerts a killing effect (not merely inhibitory).
- has a wide range of action (effective in mixed infections).
- no resistance has developed in extensive clinical tests.

Administration: Triocil Ointment should be applied directly to the affected area. It spreads easily and adheres well. Usually one application daily is sufficient, but treatment may be repeated as often as necessary.

Supplied: Tubes of 20 and 50 grams, convenient both for hospital and office use and for dispensing.

Available exclusively through ethical veterinary distributors.

Triocil

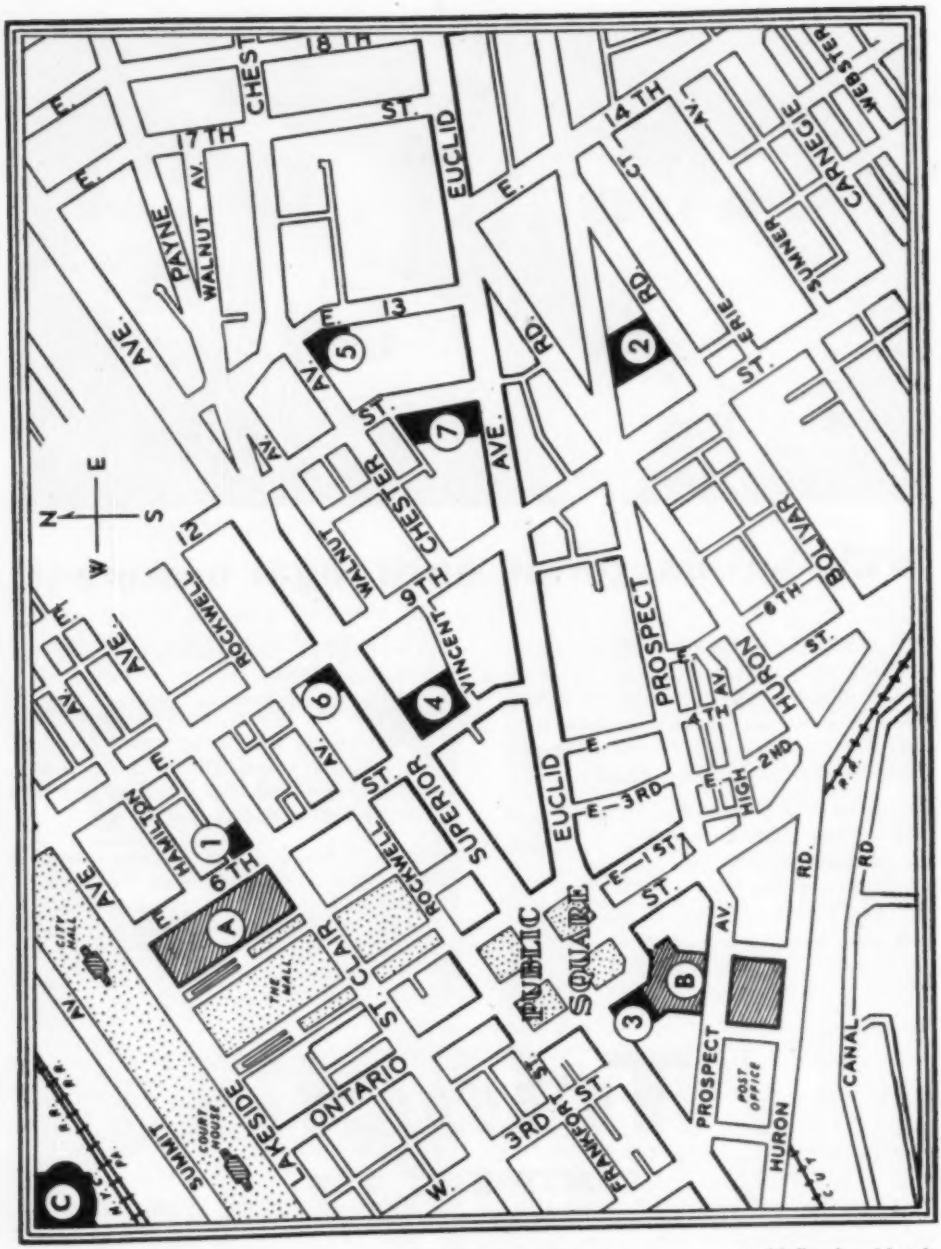
brand of hexetidine TRADEMARK

OINTMENT 0.5%

DIVISION OF VETERINARY MEDICINE

WARNER-CHILCOTT

Laboratories MORRIS PLAINS, N. J.



A. Cleveland Auditorium
B. Union Station
C. Stadium—Home of the Indians and the Browns

1. Auditorium Hotel
2. Carter Hotel
3. Cleveland Hotel
4. Hollenden Hotel
5. Manger Hotel
6. Olmsted Hotel
7. Statler Hotel

HOTEL RESERVATIONS — CLEVELAND CONVENTION

Ninety-Fourth Annual AVMA Meeting, Aug. 19-22, 1957

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

Hotels and Rate Schedule

Hotel	Single	Double	Twin	Suite
1. Auditorium	$4.75- 8.00	$ 7.50-10.00	$10.00-12.00	$25.00
2. Carter	$5.50- 9.25	$ 8.50-13.50	$ 9.50-14.25	$26.50-36.50* $40.00-48.25†
3. Cleveland	$6.50-11.00	$ 9.00-14.00	$10.50-20.00	$20.00-55.00* $44.00-70.00†
4. Hollenden	$5.00- 9.00	$ 8.00-12.00	$ 9.00-14.00	$20.00-30.00* $30.00-60.00†
5. Manger	$5.00- 9.00	$ 7.00- 9.00	$ 9.00-13.00	$18.00-45.00* $36.00-75.00†
6. Olmsted	$4.25- 9.00	$ 7.00-11.00	$ 8.50-11.00	$17.00-20.00
7. Statler	$6.00-13.00	$10.00-16.00	$11.00-18.50	$24.00-32.00* $46.50-48.50†

*—2-room suite
†—3-room suite

Tear Here

RESERVATION FORM — AVMA CONVENTION — CLEVELAND

To: HOUSING BUREAU, Cleveland Convention and Visitors Bureau, Inc., 511 Terminal Tower, Cleveland 13, Ohio.

Hotel	Accommodations
(Three choices MUST be shown)	_____Single Room(s) @ $_____
First choice hotel _____	_____Double Room(s) @ $_____
Second choice hotel _____	_____Twin-bed Room(s) @ $_____
Third choice hotel _____	_____2-room suite @ $_____
	_____3-room suite @ $_____

Arriving on (date)_____ at _____ ( ) a.m. ( ) p.m.

Departing on (date)_____

Will be occupied by (attach list of additional names if necessary).

Your Name (print or type) _____

Street Address _____

City _____ Zone _____ State or Province _____

Twin Carolinas Veterinary Medical Association, the third Thursday of each month in the Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. James R. Burgess, Rockingham, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forrest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary St., Richmond 20, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary. Southwest Virginia Veterinary Medical Association, the

ANNOUNCING

A New Approach
To Animal Examination
and Treatment
with

Sparine®

HYDROCHLORIDE

Promazine Hydrochloride — *10-(γ-dimethylamino-n-propyl)-phenothiazine hydrochloride*

for BETTER CONTROL, TRANQUILIZATION and RESTRAINT

In humans, SPARINE has produced impressive results in a wide variety of cases of acute agitation. The response to it has been dramatic.

In animals it acts to control central nervous system excitation commonly encountered in practice. In therapeutic doses, it exerts a unique effect, calming and quieting animals without inducing unconsciousness.

SPARINE greatly simplifies diagnostic examinations, replacing manual or mechanical methods with "chemical restraint," thus reducing the risk of injury to the patient or the attendant. In X-ray examinations, otoscopic procedures, dentistry, etc., it maintains the animal in a calm and manageable state.

Where self-mutilation is associated with eczema, pruritus, otitis, etc., it is invaluable as adjunctive therapy for its tranquilizing properties.

Because SPARINE is active in both oral and injectable forms, it is useful in small or large animals. Its full field of application, therefore, is defined only by the ingenuity of the individual practitioner.

Supplied:

Tablets: 25, 50 and 100 mg., bottles of 50 and 500; 200 mg., bottles of 500

Injection: 50 mg. per cc., vials of 2 and 10 cc.

Wyeth®
Philadelphia 1, Pa.

Supplied Only to the Professions

first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P. O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madison, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

CLASSIFIED ADVERTISEMENTS

Personal Want Ads—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

Commercial Want Ads—$5.00 for the first 25 words, 25 cents for each additional word.

Remittance must accompany ad.

Deadlines for Want Ads

***For JOURNAL dated 1st of month* — 8th of month preceding date of issue.**

***For JOURNAL dated 15th of month* — 22nd of month preceding date of issue.**

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted to run my practice for 2 to 4 weeks in July while I am on vacation. North Texas mixed practice; house furnished. Address "Box H 36," c/o JOURNAL of the AVMA.

Assistant veterinarian wanted in Cleveland small animal hospital. State references, experience, salary expected in first letter; Ohio license. Address "Box E 5," c/o JOURNAL of the AVMA.

Assistant veterinarian wanted for mixed practice in northern New England; modern hospital with apartment available. Married man with no military obligations preferred. Position open immediately. Address "Box H 31," c/o JOURNAL of the AVMA.

Experienced poultry service man wanted by leading feed medication manufacturer to service customer accounts. Advanced college degree preferred. Technical knowledge of poultry diseases essential; sales ability desirable. Will cover Southeast with considerable travel involved. Permanent position with liberal benefit program; salary and expenses. Please submit full resumé. Address "Box H 29," c/o JOURNAL of the AVMA.

Graduate veterinarian wanted for relief for months of July and August; small animals. Southern Ohio. Address "Box H 25," c/o JOURNAL of the AVMA.

Experienced small animal practitioner wanted to take complete charge of small animal hospital on Long Island, N.Y., for 6 months to 1 year; possibility of purchase after that period. Send complete resumé promptly, stating salary or other arrangements desired and previous experience and availability. Address "Box H 17," c/o JOURNAL of the AVMA.

Veterinarians wanted for regulatory field work in Nevada; ARS qualifications; no license required. Temporary and permanent positions available. Address Dr. J. B. Key, Secretary, P.O. Box 467, Tonopah, Nev.

To insure prompt delivery replies should be carefully addressed.

Veterinarians...working with and for Veterinarians

Here, at American Cyanamid, the veterinarians who comprise the staff of our Veterinary Professional Service Department find deep satisfaction in the knowledge that their efforts are devoted to the best interests of the entire profession.

As veterinarians, they have practical knowledge of the problems of the veterinarian—and this sincere understanding naturally results in a realistic and sympathetic approach to all the various phases of Cyanamid research and product development.

In all, 28 veterinarians are at work in the development of new and better products, which, in their belief, will provide their profession with ever more effective therapies for success and satisfaction in practice. For details write VETERINARY PROFESSIONAL SERVICE DEPARTMENT, AMERICAN CYANAMID COMPANY, N.Y. 20, N.Y.

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PROTECT
YOUR PET
AGAINST

Growing industrial research unit has new openings for 2 research and 2 development veterinarians. Investigations include antibiotics, vitamins, steroids, and related areas. Give complete details including salary requirements, training, experience, areas of interest, etc., in first letter. All replies held in strictest confidence. Address "Box H 13," c/o JOURNAL of the AVMA.

Wanted—Positions

Experienced relief veterinarian available; not cheap but good. References provided. Address "Box H 30," c/o JOURNAL of the AVMA.

Graduate, 1955, married, desires position leading to future in small animal practice in Florida; have Florida license. Address "Box H 39," c/o JOURNAL of the AVMA.

Graduate, 1947, married, experienced in small animals and regulatory work wishes employment, or partnership, or will buy; Illinois, Indiana, and Michigan. Presently employed in small animals; will answer all. Address "Box H 41," c/o JOURNAL of the AVMA.

Experienced veterinarian desires position in mixed or small animal practice leading to partnership, lease, or purchase; Middlewest preferred. Age 35, married. Address "Box H 38," c/o JOURNAL of the AVMA.

Graduate, API, 1955, will separate from Air Force in August. Age 27, married. Desire position with small animal practitioner; prefer job leading to permanent position; do not mind work. Address "Box H 6," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Relief veterinarian, experienced and competent, will operate your practice while you are on vacation. Available for New York City and suburbs. Licensed in New York and Connecticut. Address "Box H 37," c/o JOURNAL of the AVMA.

Semi-retired graduate veterinarian desires position as an assistant. Will consider any location. Address "Box H 35," c/o JOURNAL of the AVMA.

Female veterinarian, experienced, desires position as assistant in small animal practice. Licensed in Pennsylvania and New Jersey. Address "Box H 5," c/o JOURNAL of the AVMA.

For Rent

Large 6-room house; excellent condition, on busy 4-lane highway, Scarsdale, N.Y. Used 30 years as a boarding kennel; excellent site for a veterinarian. For rent at $275 per month. Address D. Sapey, 636 Central Ave., Scarsdale, N.Y.

For Sale or Lease—Practices

Wisconsin dairy practice for sale; real estate, drugs, and instruments. Address "Box G 7," c/o JOURNAL of the AVMA.

Allied Laboratories, Inc., parent firm of Pitman-Moore Company of Indianapolis, released recently its twenty-seventh annual report, indicating a new company net sales record for 1956 of $22,636,000, compared to $17,760,000 for the previous year, or a 27 per cent increase.

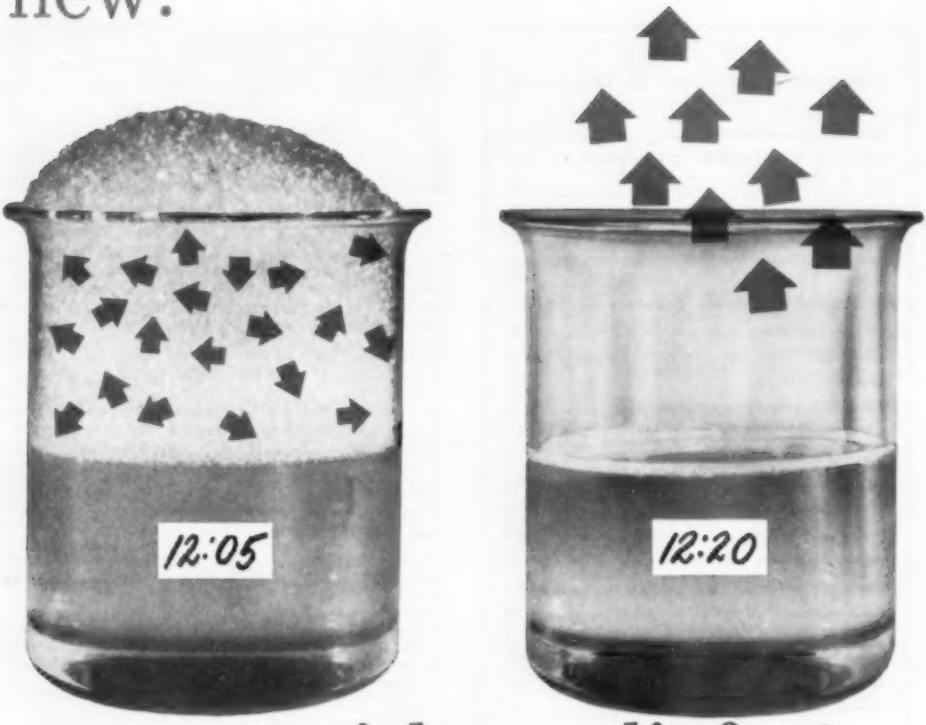
Pointing out the importance of research in the pharmaceutical and biological industry, Mr. J. L. McKee, president of Allied Laboratories, Inc., said that two thirds of the sales came from products introduced since the expansion of their research in 1950.

Approximately $1,360,000 was invested in fixed asset additions; principal expenditures were for a new four-story addition at the Indianapolis pharmaceutical laboratories. A new pathology research laboratory also was completed in 1956.

Index to Advertisers in This Issue

British firms are freezing milk in pint, quart, and gallon polyethylene packs for use on ocean liners. It is useable for at least 12 months and, when melted, is indistinguishable from pasteurized milk.—*Prairie Farm., March 2, 1957.*

new!



now quicker relief of frothy bloat with effective

BLO-TROL*

BRAND OF ACETBUTYLATE

BREAKS THE FROTHY MASS . . . releases gases entrapped in froth in three to six minutes . . . prompt deflation in 15-30 minutes through normal eructation . . . or if necessary, obtain faster relief through trocharization or stomach tube, even in frothy bloat.

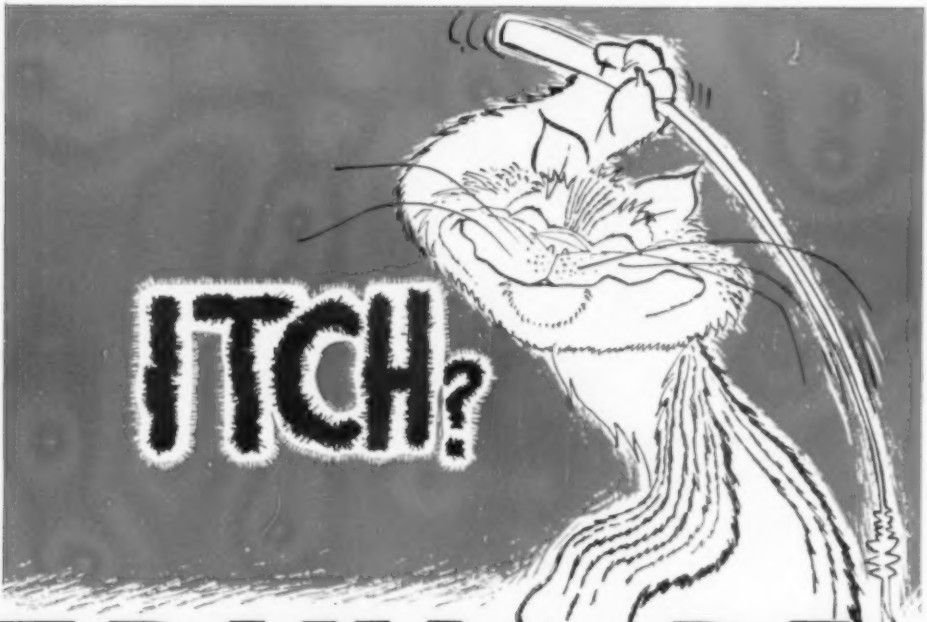
Sold to veterinarians only. Available in: 150 cc., multi-dose vials, each cc. contains 1 Gm. of acetbutylate.

Dosage—Cattle: intrarumenally or orally, 20-30 cc. Sheep and goats: 5-10 cc. Dose may be repeated in one hour, if necessary.

*Trademark

Pfizer

Department of Veterinary Medicine, PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.



TRIKICIDE

Trikicide Powder is a highly effective bactericide and fungicide for the treatment of dermatoses in both cats and dogs. A "dry" medication, it is recommended for preventing and treating ringworm, moist eczema and other weeping skin lesions, and ear canker.

The primary ingredients of Trikicide powder are 2, 2'-methylene-bis (4 chlorophenol) and oxyquinoline benzoate. Nontoxic to the host, this specially processed powder clings to the skin, promoting contact of the active ingredients with the causative agents.

Supplied: **Trikicide Powder**—Pkg. 12 x 1¼ oz. plastic spray bottles; 1 lb. hospital size.
Trikicide Solution—12 x 4 oz. plastic squeeze bottles; gallon bottles.

Other Haver/Lockhart products for the treatment of dermatoses in small animals.

FATONE POWDER AND CAPSULES
for the treatment of skin diseases due to fatty acid deficiency.

BLUSOL
parenteral for systemic treatment of protozoan infections and selected skin conditions.

Division of
HAVER/LOCKHART LABORATORIES
Kansas City, Missouri

what?

an oral iodide that animals like to eat?

new Jen-Sal

PALADIDE

trade mark

Animals like to eat Paladide . . . day after day. Here's why. Unlike other iodides you've used, Jen-Sal's exclusive* new product is insoluble in saliva but wholly soluble and biologically available[1] in intestinal fluids.

Paladide supplies more than 16 gr. available iodine per oz. of convenient, easy-to-mix base. The active agent is bound closely to large particles, thus insuring uniformity of dosage. Furthermore, the unique stability of Paladide avoids the liberation of free iodine in stock packages[2]. The odor stays pleasant, and you are assured of full therapeutic value even after the package is opened.

Safe? Paladide's active agent is fully approved for human consumption. Carefully controlled animal tests for toxicity as well as therapeutic blood and tissue levels assure a safe, yet highly effective agent for iodine therapy[3].

Available now in 1 lb. jars or economical 25 lb. pails with special measuring scoop.

*U.S. Patent No. 2,772,167
[1]J. of Nutrition, 53:1, May, 1954.
[2]Armour Research Foundation Report Project No. C616.
[3]Jensen-Salsbery Research Data: In press.

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Jen-Sal